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ORNITHOLOGICAL NOTES

Edited with an Introduction, Notes and Appendix by
NORA BARLOW

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[*Cambridge University Handlist* (1960) No. 29(ii)]

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Pp. 201–278

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DARWIN'S ORNITHOLOGICAL NOTES

[*C.U.L. HANDLIST*, No. 29(ii)]

With an Introduction, Notes and Appendix

By NORA BARLOW

INTRODUCTION

In the *Handlist of Darwin Papers at the University Library Cambridge*, item 29 has the general title: *MS. notes made on board H.M.S. Beagle*, 1832–6, and 29 (ii) has the sub-title *Birds*. In the following transcript of these *Ornithological Notes* it is possible to assess the part played by ornithology in Darwin's developing thought. The actual dates when these multi-dated notes were written are of the first importance, with the corrections and additions as part of the evidence.

The *Ornithological Notes* were finished by March, 1837, as the following correspondence shows. They were then in use as drafts for the ornithological matter spread through thirteen of the twenty-three chapters of the first edition of the *Voyage of the Beagle*[1] which appeared as Vol. III of Captain FitzRoy's official account of the voyage, published by Messrs. Henry Colburn. In March, 1837, Darwin wrote to his cousin, William Darwin Fox, on the progress of this his first book: " I am now hard at work and give up everything else for it." (*Life and Letters*, I : 279).[2] Again in July he wrote to Fox: " I gave myself a holiday and a visit to Shrewsbury in June as I had finished my Journal."[3] In November of the same year he wrote to Henslow that he was " gazing in silent admiration at the first page of my own volume when I received it from the printers!"[4] It was through FitzRoy's procrastination over the other volumes that the actual publication was delayed until 1839.

Here is concrete evidence that the *Ornithological Notes* were finished before March, 1837, for they were then being used as material to dove-tail into the script for Messrs. Colburn. Thus it is interesting to note that Darwin did not begin his first *Evolution Notebook*, dated 1837, until after he had got the MS. of the voyage off his mind.[5]

Darwin, therefore, either assembled his ornithological data of the voyage after reaching England in October, 1836, while at the same time unpacking and sorting his specimens which amounted to thousands, writing up his geological observations, attending Geological and Zoological Society Meetings to which he made contributions, and travelling by coach between Cambridge, London and Shrewsbury; or else he wrote the bulk of the *Ornithological Notes* during the last period of the voyage, while still out of reach of libraries and expert opinion. Some alterations and additions were found to be necessary when he got in touch with professional scientists in England. I believe that the second alternative is the correct one, partly from the evidence of the *Notes* themselves, which will be given in footnotes as the evidence occurs; partly from the whole lay-out of the *Ornithological Notes*, and the opportunities he had for leisurely writing during the last part of the voyage—leisure entirely lacking after his return. To me they are clearly an early assemblage of his personal experiences, written with the red-hot memory of the living bird round the skeleton list of specimens. It must be remembered that, owing to the circumstances of the voyage, and FitzRoy's meticulous conscience over his surveying duties, the *Beagle's* course along the coasts and islands of South America during the three and a half years spent on her eastern and western shores, was a very devious one. This gave Darwin the perfect opportunity for observing the distribution and limitations of species. In my view, towards the end of those three and a half years, the questions Darwin was asking were those of an evolutionist, and the belief that he collected facts at random is without foundation. Darwin is himself partly responsible for the assertion sometimes made that this was so. In a letter to Hooker, written in January, 1844, (*L. & L.*, II : 23) famous in the history of their friendship and of Darwin's slow and almost disingenuous avowal of his own revolutionary ideas, he says: " I was so struck with the distribution of the Galapagos organisms, etc., etc., and with the character of the American fossil mammifers, etc., etc., that I determined to collect blindly every sort of fact, which could bear any way on what are species." But no collection of facts with a set purpose is blind. The *Ornithological Notes* show how he was collecting, not blindly, but impartially, every sort of fact bearing on what are species.

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[1] Henceforth referred to as *B.* 1839. Second edition, as *B.* 1845.

[2] *Life and Letters of Charles Darwin, edited by F. Darwin*, 1887, henceforth referred to as *L. & L.*

[3] *L. & L.*, I : 280.

[4] *L. & L.*, I : 288.

[5] See Sir Gavin de Beer's editing of Darwin's *Journal*, and of the four Notebooks on Transmutation of Species, *Bulletin of the British Museum* (*Natural History*), *Historical Series* **2**, Nos. 1–5, henceforth referred to as *B.M. Bull.*

The following chronological record of drafts of the ornithological passages culminating in the *Voyage of the Beagle*, will help to place the *Ornithological Notes* in their true perspective. Some confusion may have arisen from Darwin's dated record of his ornithological work in the early *Journal*, pp. 8 and 9, edited by Sir Gavin de Beer (*Bull. B.M.* (*N.H.*) No. 1). These references in the years 1837 to 1839 allude to the work in which he was then engaged for the *Zoology of the Beagle*, 1841, draft VI of the following list.

I. Firstly, there are the jottings in the twenty-four small 3″ × 4″ pocketbooks he carried with him on his expeditions. Birds figure hardly at all in the first year, but in the second and third years in South America, the bird entries increase, and show how he was already noting specific differences and changes of habitat. Of these small pocketbooks, some are unfortunately missing.[1]

II. Secondly, there are the largely unexplored contents of Vols. 29 i, 30 i and ii, and 31 i and ii of the *C.U.L. Handlist*. These contain the " rough notes " to which Darwin alludes in the *Ornithological Notes* MS. 69; and in *B.* 1839, p. 353; and in *B.* 1845, p. 289.[2] The four volumes, 30 i and ii, and 31 i and ii, are written partly on

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[1] See *Charles Darwin and the Voyage of the Beagle*, ed. N. Barlow, 1945. Referred to as *V. of B.*, 1945.

[2] I have been greatly helped in this identification by Dr. Sydney Smith and Dr. Robert Stauffer. I have annotated with Dr. Sydney Smith's initials (S. S.) special points of indebtedness. See footnotes, p. 259 below.

Whatman paper dated 1828, and certainly antedate the *Ornithological Notes*. In them Darwin refers to his Personal Journal of the *Beagle*[1] as though these volumes were being written contemporaneously, and we know that he wrote up his Diary of the *Beagle* as soon as he had the leisure. Volumes 30 i and ii, 31 i and ii contain notes on all his specimens, and will form an important link when fully explored, for they are the drafts from which Darwin must have compiled the *Ornithological Notes* during the last periods of the voyage home. A few examples will be given, comparing equivalent passages of the *Ornithological Notes* and the earlier drafts. (See p. 259, and the Appendix on the Petise.)

III. Thirdly, there are the present *Ornithological Notes*, which I believe to be the assemblage of his ornithological knowledge gained on the South American continent and the surrounding islands, including the Galapagos Archipelago, and begun probably in 1834, and continued to the end of the voyage. The order is still basically that of his specimen numbers, and therefore chronological, and both numbering and the matter are based on Vols. 31, i and ii, *C.U.L. Handlist*. (*See* Editor's Note, Specimen Numbers, p. 208.) The material begins to be assessed as a whole, with comparisons and generalizations ; back references and forward references are given, with " vide suprà " or " vide infrà " written with a number indicating the related or identical species. Sometimes numbers are referred to ahead of those in the marginal sequence ; this is wholly in keeping with the belief that they were written during the last year of the voyage with his " rough notes " before him. He added three specimens to his list after leaving the Galapagos. The last four chapters of the *Voyage of the Beagle* are birdless, except for the interest in the species that visited or inhabited the islands at which they called.

IV. Fourthly, the first edition of *The Voyage of the Beagle, 1839* (*B.* 1839). The ornithological passages occur in 13 of the 23 chapters, and are taken, often with slight alterations, from the *Ornithological Notes*. All the longer discussions and descriptions occur, except that on the Frigate Bird. (*See* Footnote, p. 267.) Cross references will be given to page numbers in *B.* 1839, and *B.* 1845.

V. Fifthly, the second edition of the *Beagle*, published by John Murray in 1845 (*B.* 1845). Here the ornithological entries are mainly the same as in IV, with some curtailment and rather more alteration from the *Ornithological Notes*. It is worth noting how the terms " creation " and " centres of creation " are still retained in *B.* 1845—a comment often made by others. But it has not, I think, been noted that the creationist passages centering round his Galapagos experiences, originated earlier in the discussion on the ranges of bird distribution, see *B.* 1839, p. 353 ; *B.* 1845, p. 289 ; *Ornithological Notes* MS. p. 69 and Appendix. As Sir Gavin de Beer has pointed out in the Evolutionary Notebooks (*Bull. B.M.* (*N.H.*)), Darwin had grasped the principle of Natural Selection some time before he read Malthus in September, 1838, so that we can watch the progress of Darwin's developing thought and the gradual removal of obstacles in those Notebooks. Still earlier, the Ornithological Notebooks show that Darwin was groping for an evolutionary concept whilst still on board, but without the illuminating light of Natural Selection. The experience of the Galapagos Archipelago was not isolated, but was a culmination of the American three and a half years, which I believe made him a confirmed believer in descent with modification. In his wanderings he had become physically and mentally aware of the biological barriers of sea, sterile plain and the Cordillera Range, and the part they played in geographical isolation; the succession of forms was there before his eyes, but he had not yet found his working model of Natural Selection.

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[1] See *The Beagle Diary*, ed. N. Barlow, 1933, henceforth referred to as *Diary*, 1933.

VI. Sixthly and finally follows the *Zoology of the Beagle*, Vol. II, 4to, published with the help of a Government grant in 1841.[1] Here the description of species and genera are by John Gould[2]; whilst the habits and ranges are by Darwin. The arrangement is of course systematic, and more scientific detail is given than in either stages IV or V. As Gould was obliged to leave England for his travels in Australia in 1838, while the volume was in preparation, G. R. Gray, ornithological assistant in the Zoological Department of the British Museum, took on the remaining descriptions; but in his Preface Darwin has greatly underrated his own share, consisting of the habits and ranges. These still follow closely the *Ornithological Notes*, but are enlarged with newly acquired knowledge. Where in the *Ornithological Notes* he had been puzzled in his amateur ignorance of nomenclature and relationship, expert opinion when he reached England fully justified his untrained perception. Vol. II of the *Zoology of the Beagle* can claim to be more than an ornithological traveller's record, for it has become a fundamental step in his evolutionary purpose.

Darwin was one of the first to use observations of behaviour in species diagnosis. It was probably whilst working at *Zoology of the Beagle*, 1841, that he wrote in Notebook II, p. 82 (*Bull. B.M.* (*N.H.*) **2**, No. 3, p. 91) " Gould I see quite recognises habits in making out classification in birds "—as though he were almost surprised. Already, as a boy (*C.U.L. Handlist* 129) and in the small travel pocketbooks, his powers of perception of more than the formal attributes can be noticed, and his sympathetic participation in the lives of the creatures he observed helped him to understand their habits; form, function, adaptation and behaviour are all brought to bear on the living aspect of each species in its own surroundings.

There are some echoes of the *Ornithological Notes* in *The Origin*, of which there are no traces in *The Voyage of the Beagle*, drafts IV and V of the above list, and only slight mention in VI. This is particularly so in the case of the Frigate Bird's vestigial characters, showing how early such questions were in his mind, waiting for a fuller evolutionary answer. The corrected Frigate Bird passage, MS. p. 79, *Ornithological Notes*, runs: " The bird never touches the water with its wings, or even with its feet; indeed I have never seen one swimming on the sea; one is led to believe that the deeply indented web between its toes is of no more use to it than are mammae or the marsupial bones [added] in the male sex of certain animals; or the shrivelled wings beneath the wing-cases firmly soldered together of some Coleopterous beetles." This passage may have been added later; but I think they record his reactions to immediate observations of function, and therefore of useless vestigial characters.

As far as I know, the only extracts that have been previously published from the *Ornithological Notes* are my own on the fauna of archipelagoes, firstly in a letter to

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[1] Referred to henceforth as *Z. of B.* 1841.

[2] John Gould, 1804–1881. Taxidermist to the Zool. Soc., 1827; F.R.S. 1843; many ornithological publications.

Nature, 7th September, 1935, and in *Charles Darwin and the Voyage of the Beagle*, 1945, p. 246. Dr. Himmelfarb has questioned the early dating of the *Ornithological Notes* in her *Darwin and the Darwinian Revolution* (1959), Note 25, p. 384. Those who are interested should examine her arguments in the light of this transcript.

The passage referred to above on the fauna of archipelagoes (see p. 74 MS.), which in my belief was written in the year 1836, shows how far his ideas had reached. These ideas were constantly both guiding and receiving feed-backs from his observations during the vital South American years of the voyage. It is as though he were on the bank of a stream, discovering that all the floating straws were pointing one way; the stream of evolution explained a whole concourse of facts. In the drafts, stages I to III, described in this Introduction, many of these signs are at first only dimly apprehended; with Darwin's increasing certainty, species and their distribution in time and space, changes of form in relation to function, became the driving forces in his observations. This early underlying sense of the significance of these questions and the chances he had to test them during his travels throughout the vast South American continent, laid the foundations for his whole life's work.

If it is agreed that the main writing of the *Ornithological Notes* was completed on board, then I think it must be conceded that a concept of general laws of evolutionary development to replace the terms " creation " and " centres of creation " must have been consciously sought at the time. It is well known that these terms still found their place in *The Origin of Species*, 1859 (1st edition), p. 352. In March, 1863, Darwin wrote to J. D. Hooker: " . . . I have long regretted that I truckled to public opinion, and used the Pentateuchal term of ' creation ', by which I really meant ' appeared ' by some wholly unknown process." (*L. & L.*, III : 18.) Darwin here repeats the word " Pentateuchal " from a review of Carpenter's *Introduction to the Study of Foraminifera*, in *The Athenaeum* of March, 1863, in which the reviewer discusses Darwin's theories and his use of the word " creation ". Written in 1863, I think that Darwin could hardly have meant " long regretted " to apply only to these phrases in the *Origin*, but that his mind was reverting to the more distant past of the *Voyage of the Beagle* and his dawning hypotheses of those early years.

In the *Ornithologial Notes* Darwin's developing theories, already traced after 1837 in the Notebooks edited by Sir Gavin de Beer (*Bull. B.M.* (*N.H.*) **2**, Nos. 2–5), can now be followed back a stage further to the voyage itself. It is significant to mark the frequency of the references to the Petise story (Rhea), and to the Galapagos Archipelago, in the four Transmutation Notebooks.

EDITOR'S NOTE

Handwriting. The *Ornithological Notes* are mainly written in Darwin's more legible handwriting, except for a few almost indecipherable amendments. Spelling mistakes have been retained, as their corrections in the later years supply evidence of dating. The first page and two lines on the reverse are written in Syms Covington's handwriting; Covington was " Fiddler and boy to Poop cabin " at the beginning of the voyage, and became Darwin's amanuensis in the second year, when Darwin taught him to shoot and skin birds. He continued in Darwin's service after the Beagle's return to England. Darwin's handwriting begins at the bottom of MS., p. 1, with five lines and vertical marginal note.

Specimen Numbers. Darwin recorded his specimens collected on the voyage, in all branches of natural history, as one numerical continuity, chronologically listed in Vols. 30 and 31, *C.U.L. Handlist.* The separate specimens in spirits were recorded in another series, entered in six notebooks labelled " Cat. Specimens in Spirits ", now preserved at Down House (S.S.). The *Ornithological Notes* are written round the framework of these two series of numbers, consecutive, but not continuous, the intervening blanks referring to types of biological specimens other than birds. Covington starts with number 185, and with only nine intervening figures, Darwin takes over at 711, when the same bird, Scolopax-Perdrix, had to be considered in the light of later finds. The last numbered bird is a landrail from the Galapagos, number 3951.

Punctuation. Darwin's punctuation has been followed, except for some omission of full-stops. Their frequency in mid-sentence can hinder the reader in understanding Darwin's meaning. Where they suggest a pause for thought, I have sometimes replaced them by dash or comma. But in deleted passages given in footnotes, I have left them in as they were written.

Pagination. Darwin gave a central heading to each MS. page, sometimes adding date and place. To prevent interruption for the reader, these are placed in the left margin, as well as the new MS. page numbers. The end of each MS. page is marked by a vertical line in the text.

Darwin's added notes are usually written on the verso of the MS. sheet, the place of insertion indicated by a letter in the margin of the recto. The page numbers are in Darwin's hand, except for five, all numbered twos, which I have omitted, as they do not fit into this series. Darwin's page numbers run from 1 to 85, with an accidental duplication of 46. Notes 82A and 85A (error for 83A), were originally stuck with sealing-wax to the bottoms of pp. 82 and 83 respectively, which I discovered from their contexts in the photostats, beautifully confirmed by the residues of the sealing-wax (S.S.). The photostat pages from which I have mainly worked, consist of 131 sheets; many of the 85 numbered pages have notes on their reverses, sometimes of only a few lines, which had to be photostated as separate pages.

Watermarks. The paper is J. Whatman 1834 throughout (S.S.).

Deletions, Footnotes, Brackets. Alterations of the text show changes of mind, and I have therefore given the uncorrected texts for comparison with the final versions, and have dealt with deletions in two ways. Short alterations I have placed in square brackets: [would fall *del*]; or [*Altered from*: is perhaps the most abundant.]. When longer passages or whole arguments have been altered, I have placed the original version in a footnote. In some cases I have used the footnote for emphasizing the evidence, and occasionally I have made my own communications in the text in italics, and within square brackets. In an Appendix I have collected further information on the importance of the Petise story in Darwin's mind, taken from one of the early travel notebooks, and from No. 31 i, in the

C.U.L. Handlist; these supplement and precede the versions already given in the *Ornithological Notes*.

Square brackets and italics are my additions, and round brackets are Darwin's own. Occasionally Darwin made use of the square bracket, differentiated in the text by a large, distinct, square bracket.

Acknowledgments. I am indebted to the Librarian of the Cambridge University Library, Mr. H. R. Creswick, for giving me every facility in the Library, besides providing me with photostats from which I could work at home. Mr. P. J. Gautrey was most helpful in the Anderson Room, where Dr. Robert Stauffer's experience was also available. In the British Museum (Natural History), Mr. A. C. Townsend's counsel was most useful, whilst Miss Skramovsky, well-versed in reference hunts, came to my help. Sir Gavin de Beer gave valuable time at an early stage, and his suggestions were incorporated. Mrs. Roberton has typed for me from difficult drafts; finally Dr. Sydney Smith and Miss Sybil Fountain have given precious time on innumerable occasions, both of whom I cannot thank enough.

Itinerary of the Voyage of H.M.S. Beagle *from 27th December, 1831, to 2nd October, 1836.*

The dates are given of the arrivals and departures from the ports of call; the periods on land when the main collections of specimens were made, can thus be easily compared with the long weeks at sea, when the material was being examined and written up.

Left	England	Dec. 27, 1831
Arrived	C. Verd Isds.	Jan. 18, 1832
Left	ditto	Feb. 8, 1832
Arrived	Bahia, Brazil	Feb. 28, 1832
Left	ditto	March 18, 1832
Arrived	Rio de Janeiro	April 5, 1832
Left	ditto	July 5, 1832
Arrived	Monte Video	July 26, 1832
Left	ditto	Aug. 19, 1832
Arrived	Bahia Blanca	Sep. 6, 1832
Left	ditto	Oct. 17, 1832
Arrived	Monte Video	Nov. 2, 1832
Left	ditto	Nov. 26, 1832
Arrived	T. del Fuego	Dec. 16, 1832
Left	ditto	Feb. 26, 1833
Arrived	Falkland Isds.	March 1, 1833
Left	ditto	April 6, 1833
Arrived	Maldonado (near Monte Video)	April 28, 1833
Left	Maldonado	July 23, 1833
Arrived	Rio Negro	Aug. 3, 1833
Left	Monte Video	Dec. 6, 1833
Arrived	Port Desire	Dec. 23, 1833
Arrived	Port S. Julian	Jan. 9, 1834
Arrived	T. del Fuego	Jan. 29, 1834
Left	ditto	March 5, 1834
Arrived	Falkland Islds.	March 11, 1834
Left	ditto	April 7, 1834
Arrived	Santa Cruz River	April 13, 1834
Left	ditto	May 12, 1834
Arrived	Chiloe	June 28, 1834
Left	ditto	July 13, 1834
Arrived	Valparaiso	July 31, 1834
Left	ditto (illness)	Nov. 10, 1834
Arrived	Chiloe	Nov. 21, 1834
Left	ditto	Feb. 4, 1835
Arrived	Valdivia	Feb. 8, 1835
Left	ditto	Feb. 22, 1835
Arrived	Concepcion (earthquake)	March 4, 1835
Arrived	Gallao for Lima	July 19, 1835
Left	ditto	Sep. 7, 1835
Arrived	Galapagos Arch.	Sep. 16, 1835
Left	Galapagos Arch.	Oct. 20, 1835
Arrived	Tahiti	Nov. 15, 1835
Left	ditto	Nov. 26, 1835
Arrived	New Zealand (Bay of Islands)	Dec. 21, 1835
Left	ditto	Dec. 30, 1835
Arrived	Sydney	Jan. 12, 1836
Left	ditto	Jan. 30, 1836
Arrived	Hobart	Feb. 2, 1836
Left	ditto	Feb. 17, 1836
Arrived	Australia (St. George's Sound)	March 3, 1836
Left	ditto	March 14, 1836
Arrived	Keeling Isld	April 2, 1836
Left	ditto	April 12, 1836
Arrived	Mauritius	April 29, 1836
Left	ditto	May 9, 1836
Arrived	Cape of Good Hope S. Africa	May 31, 1836
Left	ditto	June 18, 1836
Arrived	St. Helena	July 7, 1836
Left	ditto	July 14, 1836
Arrived	Ascencion Isld	July 19, 1836
Left	ditto	July 23, 1836
Arrived	Bahia, Brazil	Aug. 8, 1836
Left	Pernambuco	Aug. 17, 1836
Anchored at Falmouth		Oct. 2, 1836

MS.1 [*First page not in Darwin's handwriting; probably Syms Covington's, his servant on the Beagle, and copyist and assistant until 1839.*] Jan. 9.

1832: Birds. St. Jago.

185 These birds were shot in neighbourhood of Porto Praya from 16th. of Jany. to 7 of Feby. Gull.

188 Cock bird common in the interior in the table land in small flocks; females of the same colour as back of bird, — runs like a lark.

189 Uncommon. Sparrow.

190 The commonest bird on the island, generally in small flocks, both round the houses and in wild desolate places.

192 Valleys, where there is no water, but still more abundant near water as
cop[1] at St. Domingo. Their stomachs contain wings etc of Orthopterous insects; and one was caught with a lizard in its craw. It is a solitary tame bird and has not the swift flight of the European species. It is the only brilliantly coloured bird in the island.

413 Eggs of the Booby, and a smaller mottled one of the Noddy. St. Pauls. April.

455 Krotophagus.[2] In the stomach were numerous remains of various Orthopterous and some Coleopterous insects. Rio de Janeiro. May.

683 Fringilla. M. Video. August.

694 Numenius, in habits like a Jack Snipe; swamps.

685 Alauda. This bird flies upwards, and then suddenly falls and with its wings expanded like some Titlarks in England in Spring time. M. Video. August.

710 [del., Vaginalis [?] — vide 99.] Bahia Blanca Septr. St. Jago

MS.1(a) The Island abounds with hawks, and a small Wren with Quails and Guinea fowl.

[*At the bottom of MS. page 1 are five lines in Darwin's handwriting, which continues throughout the rest of the Notes. Opposite these lines in the margin is a vertical addition:* Tinochorus Eschscholtzii Is. G. St. Hilaire cf Lesson.[3] *The rest of the summary of specimen 710 in the light of later knowledge continues on MS. pp. 2 and 3.*] Scolopax-Perdrix-Specimens (1224. & 1273) (in spirits 338 & 707). This bird is found in the whole of Southern S America, wherever there are arid sterile plains,

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[1] *Cop* written in margin after a specimen number is always in C. D.'s handwriting, presumably indicating a direction to his copyist, Covington.

[2] Krotophagous. Not in *O.E.D.* In the small pocketbooks Darwin carried with him on expeditions inland, he coins the word " omni-stercivorous " for dung-eating Coleoptera; date, 4th September, 1833.

[3] The vertical addition referring to Lesson and Geoffroy St. Hilaire appear to be an addition of a later date; the pen and ink are different. Darwin calls these birds Scolopax-Perdrix throughout the Notes, emphasizing his sense of their ambiguous taxonomic position. Their numbers in his specimen list are: 711, 712, 1224 and 1273, the last collected at Maldonado in May–June, 1833. This summary of his knowledge of *Tinochorus Eschscholtzii* over the whole South American continent must therefore have been written after Sept. 7th, 1835, when the Beagle left Lima.

In *Zoology of Beagle*, 1841, Darwin writes: "In the Appendix Mr. Eyton has given an anatomical description of this bird, which partly confirms that affinity both to the Grallatores and Razores, which is so remarkable in its habits and general appearance."

or open dry pasture land. At Maldonado, on the Northern shore of the
MS. 2 Plata, it is not uncommon; but on | the great plains, near the Sierra
Ventana it is abundant. We saw it in the inland plains of S. Patagonia
at S. Cruz in Lat: 50°. On the western side of the Cordilleras, at the
most southern part, where the forests cease & an open country com-
mences at Concepcion we find this bird. — It occurs throughout the
whole of Chili; & at Copiapò, it frequents the most desolate places,
where scarcely another living creature can exist. In its habits &
Structure it seems allied to the two genera of Scolopax & Perdrix. They
are found either in pairs, or in small flocks of five or six; but in the
great plains near the Ventana, I saw as many as 30 & 40 in one flock. —
Upon being approached, they [lie *del*] squat close to the ground, & are
then difficult to be distinguished. When feeding, they walk rather
slowly, with their legs wide apart, like Quails. — they dust themselves
in roads, or sandy places. — they frequent particular (dry) [added]
spots, and day after day may be found there. I observed this fact both
at Maldonado & in Chili. From their squatting habits, they often rise
unexpectedly close to a person. — When a pair are together, one may
be shot, without the other rising. — The whole flock always rises
together, & each bird utters a squeak like a snipe. — From their long
scapulars, when on the wing, they fly just like snipes. — Hence all the
Sportsmen of the Beagle called them 'short-billed snipes.' When once
on the wing the flock generally flies to a distance, with a high irregular
flight. — Occasionally I have seen them soar, like a covey of partridges.
MS. 3 — At Maldonado | I opened the stomachs of a great many specimens,
& found nothing but vegetable matter; this chiefly consisted of bits of
a thick rushy grass; pieces of the leaves of some plant, & grains of
quartz. The contents of the intestines and dung. is of a very bright
green colour. — At another time of year. & at another place, I found
the craw full of small seeds. & a single Ant. — The birds [*altered almost
illegibly to*: those I opened] were exceedingly fat. & with a strong
offensive game odor. — they are however said to be excellent eating.. —
Pointers set them. In the plains south of the Plata, I was told they
make their nests near the borders of lakes.. & lay five or six white eggs.
spotted with red. — The covering of the nostrils is soft. — Some of the
specimens have a black mark like a yoke on their breasts; I believe
these to be the males. Is the black yoke, like the red Horse shoe of the
English Partridge? In la Plata the Spaniards call them 'Avecasina'. —
I have seen them over a space of twenty three degrees of latitude.

711 Tail feathers from another, to repair the above specimen

712 cop Charadrius ... *Bahia Blanca. N. Patagonia: Sept. 1832*

713 cop Podiceps. iris of eye 'scarlet red', live in flocks. in the channels amidst the salt marshes. — do

745 cop Sterna Hab. do.

746 cop Hirundo, not very common, builds in holes in a cliff near the sea. — I

saw a flock of these birds pursuing each other & screaming, much in the
same manner as the English [character *del.*] swift. — In its external
MS. 4 characters it seems also to approximate to that bird. — Hab: do. |
747 Psittacus. Living in flocks & breeding in holes in the same cliff with the
last swallows. — The nest — with a rather small white egg.
cop Is it not curious, these birds being common, in a miserable desert plain
country, without a single tree? A noisy bird; several generally, rush
from their holes. at the same moment.
748 cop Larus. common. — Hab. do.
749 cop *Runs* about the sandy beachs; its note is high & quickly repeated,
[mistake of species *added above line*] like the cry of a young Kestril. —
750 Fringilla Hab. do
751 cop Sylvia, concealing itself in low thickets, habits like those of the Kitty
wren. — Hab. do
779 cop Sylvia — do —
789 Alaudo — do —
814 Egg of Struthio rhea — do —
828 cop Sylvia in thickets — do —
847 cop Muscicapa. Buenos Ayres
901 Tringa. Good Success Bay. T. del Fuego. Decemb. 1832 inhabiting in
small flocks the bare stony summits of the mountains [*Pencil cross in
margin.*]
902 Fringilla, mountain summits, frequenting the turf bogs Hab. do.
903 Alauda [T. del Fuego *Added later*] — do —
904 Fringilla, mountain forests
970 cop Tringa. in flocks on the beaches. Goree sound. T. del Fuego
971 Sylvia — Hab. do
972 cop [Turdus *del.*] Furnarius [*Added later in pencil*] — do
1001 Fringilla — (same as 2131 Chiloe) [*Added later*] — do
1003 Emberiza. on the mountains. Hardy. Peninsular. T. del Fuego
1026 cop Motacilla. *common* on the mountains Hab: do
1027 cop do. ... ... do — do
1028 cop Falco P. Pezoporus [*Added later Addendum* 2] *See* p. 278. — do
1046 Emberiza. March. 1833. East Falkland I.
1047 do. Perhaps the male of the last bird, but they | were not shot together.
MS. 5 They are by far the commonest land bird in the Islands —
1048 Scolopax. common over the whole island; the soil is almost everywhere
so damp, & soft, that this bird can feed. — Flight perhaps not quite so
rapid or irregular as the English species. —
1053 cop Sylvia. Hab. do. — Beak & legs large in proportion to size of body;
lives in the coarse herbage, on the peaty soil, close to the ground. — I
never saw a bird so difficult to make to fly: frequently having marked
one down to within a few yards in the open plain, I could by no means obtain another glimpse of it.—Troglodytes Platensis [*In margin, added later.*]
1054 cop Falco. — E. Falkland Isd. —

1144 cop common both here & in Tierra del Fuego.

1145 Tringa. common upland marshes. E. Falkland Isd.

1146 Sturnus ruber. Hab: do. On the east side of S. America. I saw this bird from Lat 31° to these island[s] in 52°.
cop And on the west coast as far North as Lima in 12°. — A space of 40° degrees! — (a) [*Note added on reverse of page.*] Abundant in Chili called Loyca by Molina; is said to build on the ground. —

1147 : 1148. cop Scolopax. Hab: do. — feeding in flocks on the mud banks at head of Port Louis

1160 cop Falco, probably the male of (1054); as these are the only sorts common in the Falklands.

1833 A.D. May–June: Maldonado. on the N: shore of La Plata Furnarius rufus.
1200. cop Commonly called Oven bird, & by the Spaniards Casita or house maker. The nest is placed in the most exposed situations. on the top of a post, on a stem of Cactus, or on a bare rock. The nest is composed of mud &
Maldonado MS. 6 bits of straw, it is strong & the sides thick: in shape it resembles an oven; the section being that of a hemisphere, with one end | truncated; the opening is large & arched. — within the nest. & directly in front of this, there is a partition. which reaches nearly to the roof, so as to form an antechamber or passage to the true nest. — Now. at the end of May. is busy in building. — The bird is very common, often near houses & amongst bushes. *walks* or *runs* (I mean in contradistinction to hopping), is active in its habits, feeds on Coleoptera insecta; utters loud, peculiar shrill, *reiterated* crys. —

1201 Icterus, Exceedingly abundant in large flocks, generally making much noise: habits resemble those of the starling. Is found also at the R. Negro. Lat 40°

1202 cop MS. 6(a) Anthus. resembling in most of its habits a lark; very common, not in flocks, will alight on a twig. Builds on the ground, nest simple: eggs (1592) spotted & clouded with red. — (a) eggs spotted with red two of them in (1592) [*Added on reverse of 6a*]

1203 Scolopax. Flight irregular as in Europe, makes a singular drumming noise as it suddenly stoops downwards in its flight; this it frequently repeats whilst flying round & round in a lofty circle. — I have seen a snipe in England in the summer time behave in the very same manner. —

1204 cop Not very common: iris bright red. —

1205 cop Very abundant, a most beautiful bird; sits on a twig or thistle; habits like a Lanius, but not noisy, or so active. — Both this & last species appear to catch most of the insects on the wing. — Frequent the open unwooded country. The female has some grey on her back & shoulders. — |

Maldonado MS. 7

1206 Muscicapa. — common, sits on thistles; habits like the common English flycatcher, but does not so generally return to the very same twig. Also occassionally feeds on the turf, in stomach coleoptera chiefly Curcǔlio's. Beak, eye-lid. & iris beautiful primrose yellow. — This bird is common over the Pampas, even so far as Mendoza at the foot of the Cordillera; it has not however crossed that barrier into Chili. —

1207 Fringilla, common amongst the reeds in swamps; loud shrill cry; flight clumsy, as if the tail was disjointed: base of bill dusky orange. —

1208 cop Arenaria. on sea beach

1209 Fringilla very abundant in large flocks, is female specimen. — Male with head & gorge jet black, colours more brilliant. —

1210 cop Alcedo. not uncommon; & on the banks of the Parana exceedingly numerous. Frequents borders of lakes & rivers; sits on a branch or stone, takes short flights & dashes into the water to secure its prey. Its flight is neither remarkably direct or rapid, as the Europaean species, but rather weak & undulating, as one of the soft billed birds; in its course, suddenly arrests itself, & hovers over the water. As might be expected from its figure, does not sit in the stiff & upright manner, of the Europaean species; when seated on a twig perpetually elevates & depresses its tail. — Note low, like the clicking of two small stones. Is said to build in trees: In stomach fish, internal coating of that organ bright orange.

1211 Icterus pecoris; common in flocks often mingled with Icterus (1201).

1212 *Maldonado* MS. 8 Frequently alights on the back | of cattle. In the same flock, there are commonly brown specimens (1212). Are those one year old birds, as amongst Sturnus vulgaris? or females?. — In a large flock sitting on a hedge, basking & pluming themselves in the sun. I heard many of them attempting to sing or hiss for I do not know what to call it. — The noise was very peculiar resembling bubbles of air from a small orifice passing through water, but rapidly, so as to produce an acute sound. I at first thought it came from Frogs. — N.B. This egg was obtained at B. Blanca it may possibly belong to other species, which I do not know whether I distinguished [*Later insertion from N.B.*]

1213 (same as 2169: 70). This bird has a wide geographical range, being found [almo *del.*] wherever the country is open & tolerably dry. On the east coast I met with it everywhere from Lat: 31°. to 50° in Southern Patagonia; [*altered from*: I saw it everywhere from Lat: 31° to Southern Patagonia in the valley of S. Cruz.] On the West coast it is likewise abundant from Lima (12°) to Concepcion (37°) It is exceedingly
G[1] common both in La Plata & Chili: [in the former country [it is *del.*]
MS. 8(a) being known by the name of Callandria [*corrected to* Calandria] & in

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[1] A capital G appears in the margin both at the beginning and end of the large square bracket, the significance of which I cannot explain. The substance occurs both in *Beagle* '39 and *Beagle* '45. Possibly it was for inclusion in *Z. of B.*, '41.

the latter [of *del.*] by Thenca (Molina).[1] It frequents thickets & hedges,
& is very active, whilst quickly hopping about, its tail is often expanded
and much used. — Near Maldonado, these birds are tame & bold ; they
constantly frequent in numbers the country houses, to pick the meat ;
which is hung up on the posts or walls. — If any other small bird joins
in the feast, the Calandria directly chases him away. On the wide
uninhabited plains of Patagonia another closely allied species appears
rather wilder ; it there commonly haunts the valleys clothed with spiny
bushes on the higher twigs of which it takes its stand.] [End of large
MS. 8(b) *bracket G. Beginning of Note b.*] It appears to me a curious circum-
stance as showing the fine shades of difference in habit, that when I first
saw the second species inhabiting the plains near the Rio I thought it
was different from the Maldonado species. Having procured a specimen,
they were so similar, that I changed my opinion, but now Mr. Gould,
[who was not aware of these facts *del.*] pronounces them to be distinct
kinds, in conformity with the trifling differences of habits, of which
Maldonado however he was not aware. [*End of Note* (*b*)][2] — Its cry is harsh. In
MS. 9 the Spring it sings prettily. Molina has[3] | however much exaggerated
the charms of the song, which may be compared to that of the Sedge-
warbler. It is more powerful ; some harsh notes. & some very high ones
are mingled with a pleasant warbling. The song is remarkable, as being
far superior to that of any other South American bird ; indeed I have
not heard any other bird, which properly perches itself to give continu-
ous music. — Molina has described the nest of the Thenca, as possessing
a long passage ; but I am assured by the country people, that it is a
simple large nest, built externally of the prickly branches of Mimosa. —

1214 cop Limosa. legs yellow, shot near a lake

1215 cop Sylvia shot in a garden

1216 cop Exceedingly abundant, its habits generally like the Butcher bird. — But
I have *often* seen it hunting a field, like a hawk, by hovering over one
spot. & then proceeding onwards to another. When thus in the air, &
seen from the distance, very closely resembles a hawk ; it does not

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[1] The passages contained in the two additions (a) and (b) on p. 8a MS., were much corrected, with many erasures. The text before emendments is here given for comparison : " It frequents thickets & hedges, is a very active bird in its habits in its manner of [hopping *del.*] running (?) about, & expanding its tail features [*presumably slip for* feathers] reminded me of our magpie. Near Maldonado they are fierce tame & bold ; constantly frequent the country houses to pick the meat, which is hung up on the posts or walls. — If any other small bird joins in the feast, the Callandria directly chaces him away. On the great plains of Patagonia the bird appears much wilder ; it there commonly haunts the valleys, clothed with spiny bushes. — Although this bird is placed amongst the thrushes in many of its habits, & manner of catching its prey, it seems allied to the Butcher Birds. — " Clearly the final emendations of Note b were made after receiving Mr. Gould's report on his return.

[2] This is an example of the accuracy of his early field impressions receiving confirmation by the experts. See *B.* '39, p. 63, and *B.* '45, p. 55. M. d'Orbigny had already described the two species as distinct. See footnote, *B.* '39, p. 63. For d'Orbigny see p. 242.

[3] The last lines on the song of Thenca on MS. 8 are deleted, probably in error. In the *Beagle* editions the comments on the song precede the main description. See Molina, *History of Chili*, 1809.

however stoop so suddenly. Again commonly it haunts the neighbourhead of water, & will in one place remain like a kingfisher stationary, it thus catches small fish which happen to come near the Margin. — Its flight is undulatory. & as if weighed down by the weight of the Bill. In the evening this bird seats itself on a branch & continually repeats, without any alteration, a shrill & rather agreeable cry, which somewhat resembles articulate words. The Spaniards, say it is like the words 'Bien te veo' (I see you well). & accordingly have given this name to
MS. 9 (verso) this Bird. — (a) | From their tameness, their cunning odd manners are frequently kept by children. — |

Maldonado
MS. 10

1217.1218 Xanthornus Common in large flocks. —

1219 Psittacus. Feeds in large flocks in the open plains; are very destructive to cornfields. I was told that in one year. near Colonia del Sacramiento. 2500 were killed.
cop They build their nests close together in trees; the whole composing one vast mass of small sticks. On the islets on the Parana I saw many of these compound nests.

1220 In small flocks feeding on the plains, in its flight & habits resembling our field-fares: Hops (*not walk*). in stomach seeds & ants. At Bahia Blanca I saw this bird pursuing & catching on the wing large coleoptera; iris rich brown, —

1221 Himantopus, legs rose pink. This bird is very numerous, in small; &
sometimes in tolerably large flocks. on the great swampy plains & fens
between the Sierra Ventana & B. Ayres. The genus has been wrongfully
accused of inelegance; the appearance of one of these birds when
cop walking about shallow water, which appears to be its favourite resort, is
far from awkward.—Their cry is curiously alike to a *little* dog giving tongue
when in full chace. — Often when at night sitting round our fire in those
exposed plains, I have paused to discriminate between the two sounds. —

1222 Furnarius. — This bird has a considerable distribution. On the East
cop coast, it occurs from 30° (& perhaps in this & many other cases those
bird[s] which frequent plains. reach much further to the North, to the
MS. 11 extreme limit of the great central plains) to 40°. I never saw | a specimen further South than this. On the west coast, it occurs from Concepciòn (where open country commences) 37°. to as far (at least) as Lima in 12°. — It constantly haunts the dryest plain parts, away from bushes & trees. Sand dunes, near the sea coast afford a very favourite resort. At Maldonado & at Bahia Blanca it is very abundant, it is very tame, most quiet solitary little bird; being disturbed only flies to a very short distance. Is active early in the mornings & late in the evenings (like Robin) [added]: is fond of dusting itself in a road: *walks*. but cannot run. *very* quickly; in stomach small Coleoptera, chiefly Carabidous insects. At certain times it frequently utters a peculiar shrill, but

gentle, quickly reiterated cry (so quickly reiterated as to make one [running *added*] sound). In this respect resembles the Oven bird, but as widely differs in its quietness, from that active bird. — It builds its nest at the bottom of a narrow cylindrical hole, which is said to extend horizontally to nearly six feet long. Several country men, told me, that when boys they had attempted to dig out the nests, but from their depth had nearly always failed. — The bird chooses any low little bank of firm sandy soil, by the side of a road or stream. At Bahia. Blanca, I saw a *thick* mud wall, which surrounded a house, which had been perforated by these birds in more than a score of places. When I asked the owner the cause, I had no idea, it was the work of our little friend. This affords a curious instance of want of reasoning powers; for I saw
MS. 11(a) several repeatedly flying from one to the other side of the wall. — | (a)
verso (721) in spirits a specimen |

Maldonado
MS. 12 The Spaniards call this bird Casarita, as the oven bird Casara, although the very habit, of housemaking, from which the name is derived is in this case deficient. It shows the Gauchos have observed the Natural affinity of the two species.

1223
cop Perdrix; does not live in covies, [but generally in pairs. *added*] runs more & does not lie so close as the English Partridge; not a high shrill chirp or whistle: — When riding through the country great numbers, (generally in pairs) may be seen, as when at a short distance they take no pains to conceal themselves. They are silly birds; a man on horseback by riding in a circle or rather in a spire, round & round, each time closer & closer, so bothers the bird, that it may be knocked on the head, or noosed by a running knot. at the end of a long stick, with the greatest ease. — [? Alpine var *written in margin*] Flesh most delicately white, when cooked more so than that of Pheasant, but rather dry & flavourless. — Egg (1378) V. account of Partridge (2159) & its egg, at Valparaiso. —

1224 Scolopax-Perdrix. see account suprà. —

1226
cop Certhia, does **not** [much *added*] use its tail, yet often alights vertically on the reeds & other aquatic plants, which grow round the borders of lakes, — its resort is amongst such thickets. — iris rusty red. —

1227
cop Certhia [*In margin* V. No. 1350 *del.*] same habitat as last species; keep together in small flocks: in stomach various Coleoptera

1228
cop
Maldonado
MS. 13 Certhia. This specimen is tailless: (630) in spirits has part of its tail. These feathers appear singularly liable to fall out: I could not shoot a perfect specimen: in this respect. & in the structure of the feathers, this bird is allied | to the two latter species. Haunts the same locality. & conceals itself in the reeds & thickets: iris yellow, legs pale coloured.

1229 Fringilla. [will it resemble Galapagos species *inserted later*] feeds on the fruit of the Cactus. —

1230 Bird. —

1231 cop Muscicapa; not very common; frequents the rushy ground. near lakes. — *walks* — base of the bill, especially of the lower mandible, & iris, bright yellow. — eyelid or cere, blackish yellow. —

1232 Emberiza. in very large flocks: feed on the ground of the open plains; as they rise together, they utter a low but shrill chirp.

1233. cop Turdus; utters a note of alarm, very like that of the common English thrush. —

1234 Fringilla, not common, in stomach seeds. —

1235 cop Rallus, easily rises, on being disturbed; base of bill — especially of lower mandible. bright green. —

1236 cop Tringa, on the inland grassy plains. —

1238 Picus, not uncommon: frequents stony places & seems to feed exclusively on the ground; the bill of this specimen was muddy to the base: in the stomach nothing but ants. — cry loud, resembling the English species, but each note more disconnected; flight undulatory after the manner of the same bird; tail seems very little used, although I have seen one, with it a good deal worn: alights horizontally. like any common bird, on the branch of a tree: but *occassionally* I have seen it clinging to a post vertically. — are rather wild, frequent the open plains. generally three or four together. — The old male has scarlet tuft on the head. & a [bill *del.*] few same coloured feathers at the corners of the mouth. The tongue is preserved in spirits (620). — |

Maldonado
MS. 14

1239 cop Lanius: not common, cry rather loud, but plaintive & agreeable: iris reddish orange; bill blue especially lower mandible. — I shot specimens, in which the narrow black & white bands on the breast are scarcely visible. & what is more remarkable, even the under feathers of the tail. are only most obscurely barred. As these changes varied in degree. I imagine they are the marks of different ages & not sex. —

1240 cop Muscicapa, in stomach chiefly Coleoptera.

1241 Fringilla not common

1242 Icterus in small flocks, in marshy places, not so abundant as the other species. —

1243. cop Scolopax, differs from (1203) in being rather larger & of different colours, [& is more common: *added*] this bird commonly makes the drumming noise, described in the other species, at such times is very wild:

1244. cop —Icterus, not very common, marshy places, with its beak widely open, utters a shrill, but plaintive & agreeable cry which can be heard at a long distance; the note is sometimes single & sometimes reiterated; flight heavy; is a much more solitary bird[s], than its congeners, although I have seen it in a flock: tongue cleft at extremity: young birds have their heads & thighs. merely mottled with scarlet.

1245 Fringilla, does not go in flocks.

1246 cop Anthus. rare

1247 Fringilla in small flocks, amongst bushes, females with very little yellow. —

1248 cop Certhia, legs blueish. —

1249 cop Certhia, iris bright yellowish orange, legs with faint tint of blue. — |

Maldonado
MS. 15

1250 cop Certhia. These three latter species together with (1226 & 1228) are very similar in their habits & general appearance. The genus is both numerous in individuals. as well as in species: they all frequent & conceal themselves amongst the rushes & aquatic plants on the borders of lakes, where they busily seek for small insects, & chiefly coleoptera. In this country, they seem to play the part in the economy of nature, which Sylvia does in England. Certainly they do not resemble in their habits the true Certhias. — Are they not remotely connected with the Furnarii? In all, the legs are strong in proportion to the body; when winged they crawl with uncommon activity amongst the thickets. The structure of the tail in the whole genus. is somewhat similar. & is remarkable from the looseness of its attachment; I have seen individuals of most of the species. flying about without tails. The notes, of all those which I heard, is similar, being rapid repetition or reiteration of high, but not loud chirp. The tongue in all is bifid & with fibrous projecting points; iris in all is coloured, yellowish red. —

1251 cop Furnarius-Certhia, not very common: do not frequent thickets or borders of lakes. but feed on the *ground* in open & dry situations, & occassionally alight on the summit of a twig or thistle. — from the length of tail, flight rather peculiar: legs, blueish, very pale: I have twice seen their nests. it is placed in middle of thick bush, is made of a vast number of sticks, is nearly two feet long [& cylindrical; *added*] the passage is in a vertical position, there being a *slight* bend, at its exit & entrance into the true nest, which is lined with feathers & hair. Mouth at superior extremity. — |

Maldonado
MS. 16

1252 cop Certhia legs pale colour, iris rusty red, exceedingly like to (1226) differs in length of lower mandible & curvature of upper; I scarcely believe it to be a different species, more especially as I found one specimen, which was intermediate in character between the[m] both.

1255 cop Certhia, only differs from (1248) in shape of bill upper mandible in the latter is longer. & the symphysis of the lower one is of a different shape in the two specimens. Are they varieties or species?

1256 cop Certhia, iris reddish yellowish, legs pale with tint of blue.

1257 cop Parus (?) In very small flocks, habits like European genus, there is specimen (650) in spirits, because the beak of this one is imperfect. —

1258 cop Sylvia not very common

1259 cop Sylvia uncommon; amongst reeds. —

1260 cop MS. 16(a) Furnarius same genus as (1222) this is a common bird, (a) specimen in spirits (722) is easily distinguished from the latter species, by the double reddish bands on the wings, which it shows, when flying. Its nidification is similar; namely at the bottom of a deep hole. its note is likewise similar, being a succession of one high note. quickly reiterated; the tone is rather more acute; flight similar, but does not *walk*. not very tame, chiefly abounds on margin of lakes amongst the refuse, also common. on open grassy plains, always feeds on the ground. in stomach nothing but insects & nearly all coleoptera, of which several were fungi-feeders. — Often picks amongst the dry dung of cattle: tongue of a bright yellow colour. — This bird is common in la Plata, is rare on the coast of Patagonia, yet I saw some in valley of S. Cruz. is common in *Maldonado* MS. 17 the Falklands Isds. & T. del Fuego. in which latter place it inhabits the mountains, which are bare of | trees, does not frequent the sea coast. I do not believe this bird is found so far north on the West coast. —

1261 Lanius (?) legs pale blueish; iris reddish; I have never seen but this one specimen. Coleoptera in stomach

1262 Fringilla uncommon. —

1263 cop Charadrius. legs ' crimson red ', toes leaden colour. under surface most remarkably soft & fleshy: in small flocks common on open grassy plains, often mingled with Turdus (1220). as they rise utter plaintive cry. iris dark brown. —

1264 Rhyncops. —[1] base of bill & ' legs vermilion red '. — I have seen this bird [on the East & West coasts, between Lat. 30° & 45°. — & frequents either salt or fresh water. The specimen now at the Zoological Society was shot at a lake near Maldonado, from which the water had been nearly drained, & in consequence which swarmed with small fry. — I there myself saw. what I had heard described as having been witnessed at sea. — Several of these birds, generally in small flocks, flew backwards & forwards close to the surface of the lake. with their bills wide open, & the lower mandible half buried in the water. Thus skimming the surface they ploughed it in their course; the water was quite smooth & it formed a most curious spectacle to behold a flock, each bird, thus leaving on the mirror-like surface, its narrow wake. — In their flight, they frequently twist about with extreme rapidity & so dexterously manage, that the projecting lower mandible should plough up a small fish, which is secured by the upper half of their scizzor-like bill. This fact. I repeatedly saw. as, like swallows. they continued to fly backwards & forwards close before me. — Occassionally when leaving the *Maldonado* MS. 18 surface of the | water, their flight was wild irregular & rapid; they then also uttered a loud harsh cry. The length of the remiges appears quite necessary, in order to keep their wings dry. when fishing.[1] — When thus employed[2] their forms in truth resemble the symbol by which many artists represent marine birds. — The tail is much used. in steering their irregular course. These birds are common far inland, along the course of the Parana; it is said they remain during the whole year & breed in the marshes. During the day they may be seen resting in flocks, on the grassy plains. at some distance from the water. — Being at anchor, as I have said. in one of the deep creeks between the islands of the Parana, as the evening drew to a close, one of these birds suddenly appeared. The water was quite still & many little fish were rising; the bird, continued for a long time, to skim the surface, flying in its wild & irregular manner up & down, the narrow canal, now dark with the growing night & the shadow of the overhanging trees. At M. Video. I observed some large flocks, during the day. they were seated or standing on the mud & sand banks at the head of the harbor, in the same manner as on the grassy plains. Every evening they took flight directly to seaward. From these facts. I suspect, that the fishing by day at Maldonado, was not a common circumstance, but owing to the multitudes of small fry left by the draining water. If such is the case, we can see, *Maldonado* MS. 19 how their nocturnal habits are in | accordance with the method of fishing, which probably depends as much on the sense of touch as on that of sight.[3] Besides fish, it is not improbable, that they catch other animals; of which, many. such as Crustaceae come to the surface far more abundantly, during the night than day time.

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[1] The entry under Rhyncops, the Scizzor Beak, provides interesting evidence of dating. Darwin followed up his conjectures about the sensitivity of the beak playing a rôle in the peculiar fishing habits of the species, by writing on his return home a letter to Richard Owen with a specimen of the head in spirits, asking for further enlightenment. Details will be given under footnote 1, p. 222 below.

The entry is fairly heavily corrected in a lighter ink, and the corrected version is given in the above text; this is the text nearest to *B*. '39 and *B*. '45. I give below the uncorrected first version; I have not found the meaning of the large square bracket near the beginning, with a large figure 11 in the margin, which figure is repeated where the bracket closes at end of entry.

" base of bill & ' legs vermilion red '. — I have seen this bird on the East & West coasts. between Lat. 30° & 45° it frequents either salt or fresh water. This specimen was shot at a lake from which the water had been nearly drained, & which swarmed with small fish. I there myself saw. what I had heard described as being seen at sea. — These birds, generally in small flocks, fly close to the surface of the water. with their bills wide open, & the lower mandible half buried in the water. They thus skim the surface & plough it as they proceed." The next ten lines have no revealing alterations, but at the foot of p. 17 the word " Occassionally " is spelt with the familiar long double s, but it is corrected, probably in the Summer of 1836. *See* Condor. p. 242.

[1] This sentence went through many changes. "The length of the remiges" was first deleted, and "first feathers of the wings" added above, and then also deleted, and "remiges" rewritten.

[2] Here is given a very poor diagram of the V-shaped symbol—subsequently erased.

[3] At this point in the text occur two crosses in the fainter ink, corresponding to a marginal encircled note to his copyist, Covington. "Covington leave blank of [few ? del] 3 lines." A deleted sentence follows: "It would be curious to discover, whether the flexible lower mandible is well stocked with nerves. —" The remaining description of the feeding of Rhyncops is slightly altered, but not significantly. One sentence is deleted: "The method of fishing is described in Dic: Class :. —" *del.*

An examination of *Z.B.*, '41, reveals the meaning of the instructions to Covington, and the deleted lines following. I suggest that at some date early in 1837, Darwin called in Richard Owen's help to examine the Rhyncops' head anatomically, for possible confirmation of the sensitivity of the beak. Darwin had finished the Ornithological parts of *Beagle* '39 by June, 1837, see *Preface*, and all mention of the beak resembling an organ of touch was left out of both *Beagle* '39 and *Beagle* '45. Owen's answer was not

It appears, that the whole structure of the bird, its weak bill, with the lower mandible produced[4] & long wings. are evidently adapted for such habits, & not, as according to M. Lesson,[5] to open & feed on [the *del.*] Mactrae, buried in the sand banks. —] *[End of square bracket* II]

MS.19(a) Specimen in Spirits (711)

1268 cop Larus, common in flocks near a brackish lagoon —

1269 cop Ardea, not uncommon, also in Patagonia, hoarse cry, iris & cere bright yellow. — bill waxy color. —

1270 cop Owl uncommon, in long grass: flew readily, by day. —

1271 cop Sylvia (Male of 1259?)

1272 cop Palomba — uncommon —

1273 Perdrix-Scolopax. male of (1224). V. suprà

1274 cop Turdus

1275 cop Alectrurus, sits on the top of a thistle, from which by short flights catches its prey: sometimes alights on the ground. — In stomach a spider, (Lycosa) & Coleoptera; tail appears useless in its flight

1276 cop Alectrurus is this different species?

1277 cop Parvus (?), Exquisitely beautiful — very rare, frequents reeds near lake. — soles of feet fine orange. I saw this bird at B. Blanca. & in a collection of birds in Chili. —

1293 cop Owl. — Excessively numerous, mentioned by all travellers as one of the
Maldonado most striking features in the | ornithology of the Pampas. They live in
MS. 20 burrows, which they excavate, on any level sandy part; but on the Buenos Ayres side of the Plata, where the Biscatche are found, they appear exclusively to use the holes of that animal.

During the open day, but more especially in the evening, these birds may be seen in every direction, standing, frequently by pairs, on the hillock, by their burrows. Whence they quietly gaze on the passer by; if disturbed, they either enter the hole, or, uttering a shrill harsh cry move with a remarkably undulatory flight to a short distance; whence again they gaze at their pursuer. Occassionally, in the evening they may

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written until 7th August, 1837, and the three blank lines left in the hope that the answer would arrive in time for inclusion, was not fulfilled. In *Z.B.* '41, Darwin gives the whole of Owen's answer; after the same passage on Rhyncops' night feeding, given above, Darwin writes: "I was led by these facts to speculate on the possibility of the bill of Rhyncops, which is so pliable, being a delicate organ of touch. But Mr. Owen, who was kind enough to examine the head of one, which I brought home in spirits, writes to me that: 'The result of the dissection of the head of the Rhyncops, comparatively with that of the head of the duck, is not what you anticipated. The facial, or sensitive branches of the fifth pair of nerves, are very small; the third division in particular, is filimentary, and I have not been able to trace it beyond the soft integument at the angles of the mouth. After removing with care the thin horny covering of the beak, I cannot perceive any trace of those nervous expansions which are so remarkable in the lamelli-rostral aquatic birds. . . .', Owen recalls the sensitivity of a hair through the nerve at the base, and adds: 'it would not be safe to deny altogether, a sensitive faculty in the beak of Rhyncops.'" No mention of the sense of touch in Rhyncops' beak is made in *Beagle* '39 because Owen's answer did not arrive in time.

[4] "so much produced" remains in *Beagle* '39. In *Beagle* '45 it is altered to "so much projecting".

[5] René-Primevère Lesson, *Manuel d'Ornithologie*, 2 tomes, Paris, 1828.

be heard hooting. I found in their stomachs, the remains of mice; & I one day saw a small snake, killed & carried away. It is said, that these latter animals, are their chief object of prey during the day. If, by the means of the traps, I had not been aware how wonderfully numerous the smaller rodentia are in these open countries, it would have been an enigma to explain the support of such an infinity of owls. —

1294 cop Caracara. chimango. V. Caracara novae sembae. — P. 34

1295 Water hen, bill fine green, legs brown, toes bordered by much membrane *[Cross & line in margin]*

1296 cop Parus (?), Common on the borders of lakes or ditches with water; frequently alights on aquatic plants; when seated on a twig expands its tail like a fan. —

1297 Fringilla, rare & beautiful

MS. 20(a) omitted

verso

1335 cop Procellaria. Bay of St. Mattias. Lat 43°. caught by a bent pin on a string baited with fat; is tame & sociable, & silent; approaches close to vessels, mingled with the Pintados; not abundant, seldom more than one or two seen together: I saw it on both sides of the continent. Is said to build in S. Georgia; to arrive very regularly at that place in September & to leave it at the beginning of Winter. — *[End of Note (a)]*

1340 cop Palomba, legs coloured dull " carmine red "[1] frequents in large flocks the Indian corn fields. — |

Maldonado

MS. 21

1349 cop Thalassidromus, shot in the bay, being driven in by a gale of wind;

MS. 21(b) walks on the water, very tame. (B) Is said to build *in holes* in the cliffs

verso on S. Georgia: arrives regularly in September for that purpose: The sealers do not know of any other breeding place.

1378 Egg of Partridge (1223)

1382 Perdrix; much rarer than species (1223), they are generally found several together, although not rising in a covey; frequent the swampy

cop thickets on the borders of lakes; are unwilling to rise & lie very close; utter *whilst on the ground*, a whistle, which is much shriller than in the other species; when on the wing fly to a considerable distance: meat, when cooked, snow-white. I have seen this bird at B. Blanca, Northern Patagonia.

1383 cop Ostralogus. R. Plata *[Possibly meant for Ostralegus ?]*

1384 cop Sterna do

1385 cop Palomba, exceedingly abundant, living in small flocks, in every sort

cop of locality. —

1390 Larus: soles of feet deep " reddish orange " & bill " dull arterial blood red ". Is said to *breed*. & frequents fens far inland. — Near B. Ayres attends, together with the carrion Vultures, the outskirts of the slaughtering houses. —

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[1] From Werner's *Nomenclature of Colours*, Edinburgh, 1821.

1396 cop Falco, *not very uncommon.* —

N.B. [*Nota bene*] In this undulating open grassy country, birds are very numerous, especially (I refer to number of individuals as well as of species) Cassicus. & Lanius. (including such birds as Callandra). The months of May & June correspond to the early part of Winter. — It is impossible not to be struck with the great beauty of the greater number of the birds; the most prevailing tint is yellow, & it is worth noting, that the same colour is strikingly characteristic of the Flora. — As songsters, the whole are miserably deficient; I have not heard one, excepting perhaps the Callandra, which | could be compared even with the second class of our English performers. — MS. 21(a) *verso*

Besides the Birds, already mentioned, there were several hawks, which I was unable to procure: The gallinazo, but the Vultur aura, I do not recollect having seen: Caracara, vulgaris:

Amongst the smaller land birds, my collection is very perfect, day. after day. walking long distances & unable to procure any other specimens. — Fringilla *1615* very common: 903: Sturnus ruber: The Cardinal is found here: 1439 in summer the large Kingfisher of T. del Fuego: Icterus 1418. very rare: Certhia 1451 very rare: Ostrich: Vanellus 1602: A small snow white & large lead-coloured Heron: a great crane: Ibis: a large sort of Water hen: some ducks: the black-necked swan. & swan with black tips to wings, both of which are found in T. del Fuego. — |

MS. 22

1402 cop Ptarmigan, shot on summit of Katers peak (near C. Horn) 1700 ft high: not uncommon, on the southern mountains of T. del Fuego, living on the parts above the region of forests; either in pairs or small coveys; not very wild; lie close. —

1403 cop Tringa. East Falkland Isd
1404 cop Sylvia. Hab: do. —
1414. cop 1415: 1416. From St. Fe. Lat 31°. North of B. Ayres.
1417. Sparrow. Hab. do
1418. Icterus. Hab. do: Also found very rarely at Maldonado.
1419 cop Duck. Buenos Ayres
1420 cop Plover — do
1421 cop Duck — do
1422 cop Charadrius, common in small flocks, plains of B. Ayres
1423 . in small flocks. inland —
1424 cop Shot on board Beagle. on the Plata
1425 cop From an inland marsh. — — do
1426 Icterus B. Ayres
1427 cop Small flocks, very noisy chattering bird — do
1428 cop Woodpecker Hab — do
1429 cop Grebe, fresh water — do
1430 cop 1431 cop — Birds — do

1432. Specimen of female was shot at Maldonado — do

1433 cop Charadrius. banks of the Plata — do

1434 Bird — do

1435 cop Arenaria. banks of the Plata. — do

1436 cop Duck

1437 cop Female of (1439). —

1439. cop Common, both here & at Maldonado. (October), but not in the winter, at the latter place, & therefore must be migratory. —

1444 cop Bird lives near the beach. Bahia Blanca. Northern Patagonia

1445 cop Swallow. nest in holes in cliff. — — Hab do —

1446 cop Owl. — — Hab do — |

Northern Patagonia

MS. 23

1447 cop Perdrix. frequents, sand dunes & other barren very dry places. — Is it same species with common species of La Plata? Habits similar, but appears rather smaller; lies closer; country far more sterile. Bahia (Blanca, sandy & shingle desert plains) Lat: 38°.

1448 cop Sylvia — Hab — do. —

1449 cop. Charadrius. — do —

1450 cop. Bird. Same as at Maldonado. B. Ayres.

1451 cop. Certhia: B. Ayres: not uncommon at St Fe: one specimen was shot at Maldonado: —

1452 cop — B. Ayres

1453 Shot on board Beagle in the Plata

1454 cop Duck — Bahia Blanca.

1455 cop Larus: saffron yellow, base of lower mandible brownish orange, legs yellow. but not so bright as beak. — These birds often fly 50 & 60 miles inland; frequent slaughtering houses; make the same noise, which the common English gulls do. when their breeding places are disturbed.
Hab — do —

1456 cop Falco. — Hab — do —

[***1833***] *Rio Negro*. Lat 41°: sterile bushy plains

1458 cop Ibis, very common in large flocks in the great swampy plains between Bahia Blanca & Buenos Ayres: flight soaring. singularly graceful, the whole flock acting in concert. —

1459. cop Bird. frequently utters a loud singular cry: is very remarkable from the extreme activity, with which it runs, at the bottom of hedges & thickets; might be mistaken for a rat; is with difficulty made to take flight. — Rio Negro

1460 cop Thrush — T. abliventus [***added later***] Hab. do

1461 cop Callandra. V. supra — do

1462 cop Sylvia do

1463 cop Dove do |

MS. 24

1464 cop Falco. I have seen it at Maldonado. Negro.

1465 Fringilla hab. Do

1466 do. is found in small flocks, inhabiting the most sterile parts of the
deserts, between the Rios, Negro & Colorado. —

1467. Furnarius: Inhabits the most arid & sterile parts, in northern [*del*]
cop Patagonia, & on the West coast, the similar country in Northern Chili;
flies quietly about, & hops very quickly along the ground: often turns
over & picks the dry pieces of dung. — (I saw one at Port Desire. Lat.
MS. 24(a) 48°.)
verso [*probably added later.*] (a) Specimen in spirits (728)

1468 Fringilla — Rio Negro

1469 Actively [*added*] Hops about the bushes, very much like a Parus: but
also runs very quickly on the ground; utters harsh shrill quickly
cop repeated crys: does not use the pointed tail as the Certhia. — Nest is
said to be very large & long, (2 ft) formed by a vertical passage, with
mouth open upwards; is placed in any low thorny bush & is composed
externally of the most prickly branches. This nest has, I believe, been
described by Molina as belonging to the Callandra or Thenca. — Frequents in considerable number. the dry bushy valleys of the whole of
Patagonia & the similar country of Chili; from which latter place comes
(2193). Hab. do

1470 cop Turdus. — do —

1592 6. eggs. M. Video: 3 of Fringilla 1615: 2 of Anthus (1202). One larger
one. see account of the Fringilla.

1833 *M. Video. R. Plata. November (1833).* —

1600 Lanius. beautiful, most singularly white for a land bird; rather shy;
cop rare at M. Video. common about St. Fe. Lat 31°. —

1601 cop Sylvia. M. Video

1602 Vanellus, found in Lat 30°–45°. in both sides of the | continent. — In
MS. 25 La Plata is called by the Spaniards Pteru-Pteru, in imitation of their
cry; & in Chili Theghel by Molina.[1] Frequent all parts of the open
grassy country & especially near lakes: Habits in many respects similar
to our peewits: (a) They do not go in flocks. but commonly in pairs.
MS. 25(a) [*added on reverse of sheet*] appear to hate mankind. & I am sure deserve
verso to be hated, for their never ceasing, unvaried. loud. grating screams.
pursue & fly round the head. of anyone who invades their haunts:
continue their noise even in the night time, [but it is very far from true,
that, this is, as Molina has stated the only time; — *del.*] To the sportsman they do much harm, by telling every other bird of his approach;
to the traveller in the country, they may do good, by warning him of
the mid-night robber. —
cop During the breeding season, like our Peewits feign being wounded to
draw away dogs. or other enemies. — Eggs pointed oval, brownish olive,

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[1] *History of Chili*, Vol. I: 213, 1809.

thickly spotted with dark brown, esteemed very good eating. — iris of eye, scarlet red. —

1603 cop [Sylvia. *del*] Tringa. M. Video
1604 cop Muscicapa. — do —
1605. Fringilla — do —
1606 cop Charadrius, in large flocks — — do —
1607 : 1608. cop two species of Tringa — — do —
1609 cop Swallow. most common sort — — do
1610 cop Trochilus, not very abundant. — do
1611. 1612. Fringilla — do
1613 cop Muscicapa — do
1614 cop Fringilla — do

1615 Fringilla : one of the most abundant birds of S. America ; on the East
coast it is found from Lat 30° to T. del Fuego, abounds most in the open
cop grassy country of la Plata, but in the desert plains of Patagonia is
perhaps of their few inhabitants the most common. [*Altered from* : is
perhaps the most abundant] |

MS. 26 On the East coast, it is numerous as far (at least) as Lima in 12°. In the humid forests of T. del Fuego, it is far from scarce. It generally prefers inhabited places, but may be met with in the most unfrequented rocky mountains ; in the Cordillera, I saw it at an elevation, which could not be less than 8000 ft. — Although so common about the houses in la Plata, they have not the air of domestication of the English sparrow ; & although Englishmen give them that name, they as little deserve it, as the gorged Gallinazo does that of Cuervo or the rook. — They are never seen in flocks. At M. Video. found a nest on the ground, in it 3 eggs [4 *del*] white [ones *del*] spotted with brown, & one larger one also spotted with red ; I had before heard, that a bird, called Cusco, lays its egg. in the Sparrow, & other birds nest. — (1592)

1616 : 1617 Fringilla. cock & hen. shot together : M. Video
1618. cop Swallow. Hab. do
1619. cop Oven bird — do
1620 cop Callandra ?

1621. 1622 cop Cock & Hen. scissor tail. as it is called by the Spaniards. Sits on the
bough of a tree, & takes short flights in pursuit of insects ; is in its
cop habits & appearance on the wing, a sort of charicature likeness of our
English swallow ; In its flight turns very short, at which times, opens
MS. 26(a) & shuts its tail, sometimes in a horizontal or lateral, & sometimes in a
verso vertical position, just like a pair of scissors. | A forked tail is evidently
of great utility in turning short. — We see it in the Frigate Bird ; the
swallow, the Tern, & Rhyncops. In the Frigate Bird & in Rh[y]ncops,
this power is possessed in the most perfect degree. ***end of note** (a)* — Is
very common in the neighbourhood of B. Ayres. & frequently takes
advantage of the few Ombu trees which stand near the Estancias or
farm houses.—

1623 cop MS. 27 Caprimulgus. Rio Plata ; not uncommon | the wooded banks of the Parana at St. Fe : in the day time rises from the ground, on being, disturbed. in the same lazy manner as the English species. — I saw one alight on a rope in a rather diagonal position. —

1624. cop Procellaria, shot Lat 42°. 20'S. : in stomach beak of Sepia. — I saw it also off the mouth of the Plata ; rather wary, does not commonly approach vessels

1834 Janu : 1834 Port *Desire. Lat 48°. S.* dry sterile plains of shingle.

1661 Duck. 20 miles up the Harbor.

1698. cop Furnarius. tolerably common, in the most desert [*corrected from* desart] spots. — do

1699 : cop. 1700 cop two species of Lanius, both shy, scarce, solitary, frequenting the wild valleys, with thorny bushes, on a twig of which they take their stand. Hab do

1701 Fringilla not very uncommon in the valleys. do

1702 cop Furnarius, somewhat similar habits, with the species of la Plata (1222). which it may be considered to replace ; frequents dry sandy places where there are a few bushes. in which respect it differs. — Coleoptera in stomach [*added later*] — rare. — do

1703 cop Sylvia. in bushes. near sea coast. do

1704. Sparrow. apparently same as (1615) but the egg (1710) is decidedly different ; I do not however believe there is any mistake in either case ; the commonest bird on the plains. do

1705 cop Certhia — actively flying about apparently same genus with (1250). habits nearly similar. — do

1706 copied Hawk. nest in low bush. egg (1710) — do

1710 cop Egg of Hawk (1706) & sparrow (1704) — do

1752 cop Lanius. amongst bushes. *Port St. Julian. Lat : 49°*

1753 cop Sylvia Hab. do

1754 cop Furnarius same as (1702). — do

1756. cop Cormorant. skin round eyes. " campanula blue " cockles at base of upper mandible " saffron & gamboge " yellow mark between eye & corner of mouth " orpiment orange " builds in numbers on low cliff. — legs scarlet (? — do |)

MS. 28

1757 cop Larus. — Beak coloured palish " arterial blood red " legs " vermilion red ". Port St. Julian

1758 cop Hawk, iris light brown, legs gamboge yellow. Hab. do

1700 omitted [*added later*]

1771 Sparrow same as (1704). Port Desire

1772 cop (a) Caracara. (Chimango ?) vide account of genus. — ***end of note (a)***

MS. 28(a) Hawk. iris *dark* brown. legs. blueish. do

verso

1773 Ibis. Frequent the most desert open plains, generally in pairs, & during parts of the year in small flocks : builds nest in rocky cliffs on the sea cop shore ; eggs dirty white freckled with pale reddish brown, circumference. over long axis seven inches. — In stomach. Cicadae. Lizards. & *Scorpions* ! Cry very singular & loud, at a distance I often mistook it for the neighing of the Guanaco. — Legs " carmine & scarlet red ", iris scarlet red. —

N.B. On the dry sterile plains of Port Desire & St. Julians, both the number of species & of individual birds is small. — Besides those enumerated. The Condor is found. — Caracara Vulgaris unfrequent. — Sturnus ruber. Scolopax-perdrix. Callandra 1220. Charadrius 1623 : each in small numbers.

1834 St. of Magellans. Feb. 1834

1778 cop : Two species of Ducks. fresh water. C. Negro

1779 cop.

1780 cop Grebe, iris scarlet red, do. do

1781 cop Hawk, iris brown. — male — — do

1782. cop Petrel legs " flax flower blue ": This bird in its habits is a complete
diver ; it frequents the deep quiet creeks & inland seas of T. del Fuego ;
is common, I saw many in the Beagle channel & other parts. they were
present in similar situation in the Chonos archipelago Lat. 44°. — Once
only have I seen an individual out in the open sea, & that was between
the Falklands & T. del Fuego. On being disturbed from the surface of
the water, flight direct, rapid, drops from the air like a stone, & as
MS. 29 quickly | dives to a *long* distance. Commonly at the very instant of
rising, with the same action, takes to the wing. This is when disturbed,
otherwise it swims & dives about after the manner of a grebe. At Port
Famine, I have seen these birds, in the evening, flying. of their own will.
in direct lines, from one part to the other. — Sts. of Magellan

1783 cop Gull. legs & base of bill brownish cream colour. Hab, do

1784 Icterus. common, small flocks, *runs* on the ground noisy chattering bird like a starling : common in Chili & whole west coast feeds on moist pastures in large flocks. builds in bushes : can be taught to talk & is kept in cages. — called by Molina " Cureu "

1814 Egg of Avestruz petise, (?). See account. — Port Desire.

1816 cop Puffinus this bird is very abundant in the Sts. of Magellan, near Port Famine. Mr Bynoe has seen it in numbers in the deep creeks of Western Patagonia. In the inland sea. behind Chiloe. Lat 40°. there were more of these birds together, than I ever saw of any other sort. Hundreds of thousands flew in an irregular line in one direction for several hours ; when the flock settled on the water, its surface was black with their numbers.[1] It is said in Chiloe, that these birds are very

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[1] Written in margin : " 1624 off mouth of Plata. Wary would not approach Vessel Beak of Cuttlefish " The reference number is to specimen number 1624, Procellaria, the Great Nelly or Breakbones, Quebrantahuesos of the Spaniards. See *Beagle* '39, p. 354, *Beagle* '45, p. 289. Beneath the note is added " Callao ".

irregular in their movements, appearing in certain places in vast
numbers, & on the next day not one being there visible. At this
time the water contained clouds of small Crustaceae. When the
flock was settled on the water, a cackling noise proceeded from the
whole, as of human beings talking at a distance. On the East. coast of
T. del Fuego in the open sea, occassionally, two or three might be seen
MS. 30 flying about. At Port Famine I had | a good opportunity of watching
their habits. Early in the mornings & late in the evenings they were
particularly active ; at such times they might be seen in long strings
flying up & down, close to the surface of the water, with extreme
rapidity. They occasionally settle on the water, & spend a great part of
the day, thus resting. When thus flying backwards & forwards [distant
from the shores *inserted*] they are evidently fishing, yet I scarcely ever
saw one take its prey. — One being slightly wound[ed], was quite unable
to dive. Stomach much distended, with a small fish & seven or eight
good sized Crust Macrouri (such as 820). They are shy & wary & will
but seldom approach within gun shot of the boat or ship. This specimen
was killed late in the evening. — There is not the slightest difference in
the plumage of the males & females. — In foot, the inner web is coloured
" red lilac purple ", edges of all & greater part of outer web blackish :
legs & half of lower mandible blackish purple.

1834 Port Famine. beginning of February. 1834

1817. cop Tringa sea. coast.

1818. Fringilla common on the outskirts of the forest.

1819 : cop 1820. cop Not uncommon in T. del Fuego, & along whole west coast, even as far as Valparaiso (2198). Near Port Famine this bird inhabits the gloomiest & darkest recesses of the great forest ; is generally seated high up amongst the tallest trees, whence it continually utters a *very* plaintive gentle whistle in the same tone. It can be heard some way, yet the sound appears to come from no particular place, direction, or distance. We were some time, before discovering its author, hidden [in] the foliage of the great trees|

MS. 31

1821 cop. Muscicapa. not uncommon on outskirts of forest, sits on a dead branch. Port Famine

1822. cop Furnarius. same as (1260) see account Hab. do.

1823 cop Furnarius, resembles the latter species. differs from it both in structure & in habits. This bird is exceedingly common over the whole of T. del Fuego & in Falkland Id : it extends some short way along the East coast, & on the west on the shores of the deep channels is very common ; it was present even as far as Northern Chili, at Copiapò. — It haunts almost exclusively, sea-beaches, whether they be rocky or shingle. I however saw [one *del*] a few a hundred miles inland, on the pebbly banks

of the S. Cruz; & likewise in Chili, the broard beds of the rivers.
constituted like sea-beachs draw them from their proper locality. (a) I
MS. 31(a) *verso* must also except a few I saw in the desolate valleys of the Cordillera,
at a height that could not have been less than 8000 ft. (*End of Note* (*a*).]
In T. del Fuego they feed entirely on small marine animals, at high
water mark. & frequently haunt the floating kelp leaves. which grow to
the surface. M. Pernetty & subsequently M. Lesson, has remarked on
the very remarkable tameness of this bird; in this respect it differs a
little from the last species. & generally in its quiet habits is more allied
to species (2297): *walks*; utters like its congeners, the same kind of
shrill but not loud, quickly reiterated cry. — On Sept: 20th. (about
60 miles South of Valparaiso. 34° Lat) I found a nest of one of these
birds with young birds; it was placed, in a cavity, near the roof, at the
end of a large cavern. Three months later in the Summer, in the Chonos
Archipelago. Lat 45°, this bird had eggs: (What a difference in time &
therefore climate in 700 miles southing!) the nest was placed in a hole
beneath a tree on the coast, but hole *not excavated*: egg (2426); nest
built of coarse grass. untidy: I was told holes in banks are also used: — |

MS. 32 In the Falkland Islands, I shot specimens (1931) which appeared much darker coloured than those of T. del Fuego, — habits same, in stomach — there was a small Cancer. brachyurus. & a Buccinium ·25 of an inch long. — If I was obliged to compare the habits of this genus to birds in England. I should say, they most resembled the wagtails, but certainly not so active. —

1824 cop Muscicapa. within gloomy forest. tame, quiet & very rare, — specimen much shattered. Port Famine

1825 cop Creeper. *rare*. actively hopping about bushes, shrill rapid note. — Hab. do.

1826 Sparrow (not uncommon) — do

1827 cop Swallow. builds in cliffs — do

1828 cop Wren, utters a very curious loud cry; frequents the bottom of stumps of old trees, on the outskirts of the forest; is very hard to see or to make to fly. — Hab. do —

1829 cop Wren, shot in deep forest, (cock of last ?) do

1830 Fringilla, active tops of the beech trees, within deep forest, wild. — do

1831 cop Wren. *very* abundant. outskirts of forest, this bird. & the common Certhia. two most frequent birds in the wood. —

1832 : 1833 Feathers of Ostrich. petise. see account

1834 Head of do. P. Desire. — do

1835 : 1836 Legs of do —. do

1837 feathers. Gregory bay — do

1838 Hide of do. do. — do

1875 cop Owl. bought from some Fuegians. Ponsonby Sound. —

1879 Fringilla, abundant in large flocks, in all parts of East. Falkland Isd. — very tame. —

1880 cop Tringa. in flocks. on sea beach. Hab. do. — |

MS. 33 East Falkland Isd. —

1881 cop Hawk.

1882 cop Caracara vide infrà (1932 : 1933) Hab : do

1898 cop Lark, not uncommon. Hab. do : — I was informed by a Sealer that this bird is found in Georgia & South Orkneys (Lat) [*left blank by C.D.*] & that it is the only land bird on those islands. — In Georgia it must be a bird of passage, for during the greater part of the year the snow reaches to the waters edge. This lark might very properly be called Antarctica : do

1899 cop Muscicapa, inhabits chiefly the dozen & more stony hills, & likewise the sea-coast. Hab : do

1900 cop Turdus ; inhabits the same parts as the last bird, also not uncommonly around buildings, especially any old shed ; tame & inquisitive, like an English thrush ; generally silent, cry peculiar. — Hab. do

1901 cop Owl. *E. Falkland.* or Hab. do.

1915 cop Vultur aura. vide infrà Hab. do

1916 cop Hawk : female, (dissection). chiefly preys on rabbits

1917 cop Grebe : female ; male is of exactly same plumage : frequent the inland & tranquil arms of the sea. Iris dark red. — Hab. do

1918 cop Grebe, only seen in one fresh water lake ; female : legs — same colour as back, " iris scarlet & carmine red ". pupil dark. — Hab. do

1919 : 1920 Emberiza shot on the hills out of the same large scattered flock : (1920 is commonly shot in the lower land & may be seen with (1879). Hab. do

1922 Emberiza ; female ; shot with (1919). — do

1923 do. Shot on the plains ; same species or different? do

1926 cop Hawk ; male : iris " honey yellow ". Hab. do

1931 cop Furnarius. see account with (1823) — do |

MS. 34

1932 cop
1933 Caracara. nova Zelandae ; female : 1933. sex unknown. & (1882) sex unknown). — legs " ash grey ". —

N.B. (N.B. For convenience sake. I shall here put together all my notes on *the Carrion feeders of S. America.* —[1] *Caracara. Braziliensis* or vulgaris, is a very common bird & has a wide geographical range. I have seen it most abundant on the open plains of la Plata ; [where it is called Carrancha, but *inserted later*] it is not unfrequent. in the most desert parts of Patagonia : [*beginning of square bracket in text, ending p.* 235, *labelled* H.] [In the Traversia between the rivers Negro & Colorado, numbers constantly attend on the line of road, to devour the [carcases of the *added later*] exhausted animals, which may perish from fatigue & thirst. On the west coast. it is abundant, even as far as Lima : although thus so common over [in *del*] these open & dry [arid *del*] countries, it is nevertheless [*added*] found inhabiting the damp impervious forests of West Patagonia & Tierra del Fuego.[1] The Carrancha together with the Caracara chimango constantly attend in numbers around the Estancias & slaughtering houses; if an animal dies on the plain, [fields *del*] the Gallinazos commence the feast, & then the two [*added*] Caracaras pick the bones clean. — These birds[2] although thus commonly feeding together, are far from being friends, When the Carrancha is quietly seated on the branch of a tree or on the ground, the chimango will continue for a long time, flying backwards & forwards, up & down, in a semicircle, trying each time at the bottom of the curve to strike his larger relative; the Carrancha however takes little notice, excepting by bobbing his head. —[3]

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[1] See *Beagle* '39, p. 63 ; *Beagle* '45, p. 55.

MS. 35 Although the Carranchas are frequently | assembled [*added*] in numbers, they are not gregarious; in desert places they may be seen solitary, or more commonly in pairs. Besides the carrion, of larger animals, these birds frequent the sides of streams & sea beaches to pick up whatever the [sea *del*] waters may cast up; by these means, in Tierra del Fuego & on the west coast [it *del*] the Carrancha must entirely live. They are said to be very crafty & to steal great numbers of eggs. — they attempt, together with the Chimango, to pick off the scabs, from the sore backs of the horse & mules, — the poor animal with its ears down & back arched, [on the one hand *added*] & on the other, [above, *del*] the hovering bird, eying at the distance of a yard, the disgusting morcel, form a picture, which has been described by Capt. Head,[4] with his own spirited accuracy. The Carrancha will kill a wounded animal; & Mr. Bynoe, near M. Video, saw one seize in the air, a live partridge, which escaped from his hold & was for a long time chased [*corrected from* chaced] on the ground. — I believe this fact to be far from common; anyhow there is no doubt, that the chief part of their sustenance is derived from carrion. A person will discover [see *del*] the "necrophagus" habits of this Caracara by walking out on one of the desolate plains, & there lying down to sleep, when he awakes, he will see on each surrounding hillock, one of these birds patiently watching him. with an evil eye; it is a feature in the landscape of those countries, which will be recognized

MS. 35(a) *verso* by every one who has wandered over them. (a) If a party goes out hunting with dogs & horses, it will be accompanied, during the day, by several of these attendants.

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[1] Deleted paragraph: "Neither it, nor the Caracara chimango have found their way across to the Falkland Isds."

[2] Altered from: "This bird & the chimango,"

[3] Here there is a small diagram in margin crossed out. In the small pocket notebooks when near Chiloe, dated 28th November, 1834, Darwin notes: "Chimango torments swing swang the Carrancha".

[4] *Rough notes of journeys in the Pampas and Andes*. By Sir F. B. Head, London, 1826. Travelled in S. America as manager of the Rio Plata Mining Association.

After feeding, the uncovered craw protrudes outwards [(?) *added*] at MS. 36 such times, but likewise | generally, the Carrancha is an inactive, tame, & cowardly bird. — Its flight is heavy & slow; it is like that of an English crow. — It seldom soars, I have however twice seen it, at a great height, gliding through the air with much ease. — It *runs* [(in contra-distinction from hopping) *added*] on the ground, but not with quite so much celerity as some of its congeners. — At times the Carrancha is rather noisy but is not generally so; the cry is loud, very harsh & peculiar; it may be likened to the sound of the Spanish gutteral g, followed by a rough double rr. Perhaps the Gauchos from this cause have called it Carrancha. Molina who says it is called Tharu in Chili, states, that when uttering this cry, it elevates its head, higher & higher, till at last (with its beak wide open) the crown almost touches the lower part of the back. This fact, which has been doubted is quite true; I have seen them several times with their heads. backwards. in a completely inverted position. — The Carrancha builds a large coarse nest indifferently; in any low cliff. or in a bush or lofty tree. — (a) To these observations I may add on the MS. 36(a) *verso* authority of Azara,[1] that the Carrancha feeds on worms shells. slugs, grasshoppers and frogs: that it destroys young lambs. by tearing the umbilical cord, and that it pursues the Gallinazo, till that bird is compelled to vomit up, the carrion it had lately gorged. Lastly Azara states that several Carranchas five or six in number. will unite in chace of large birds, even such as Herons. —] [*End of large square bracket* H *-labelled H, beginning p.* 233, *and of note* (*a*) *on reverse.*] I am in great doubt about the plumage of the two sexes & ages of this bird. At Port Famine, I shot a female, apparently an old bird, with the eggs well developed in the Ovarium. Bill, cere, & legs. coloured as in description in Dic: Class[2]. — Head "Liver & blackish Br." (Over the whole plumage. this is the tint of the *dark* browns, & the *pale* browns are "yellowish Br") — Gorge rusty yellow; breast & under tail coverts banded (bands $\frac{1}{10}$th. inch wide) with pale brown & rusty yellow: Back banded with MS. 37 dark brown: wing coverts pale brown: of 6 first | remiges, central parts whitish; under parts of secondaries broad bands. Rectrices broad bands, outer margins of outer feathers darker. Length (full stretch) 18½ inches; from tip to tip of wing 4 ft. 7 inches.

On the plains of S. Cruz. I saw *many* Caracaras, like specimen (2028). I shot several of them & opened their bodies, many were females, others, (as for instance this specimen) had the organs quite smooth. There were some with more white on their throats. — Is this the Ca. vulgaris? if so where were the old cock & old Hen birds — Yet in Chili & la Plata I have *occassionally* [seen a pale brown variety similar (speaking from recollection) to these. — Habits same as Carrancha. — I do not know what to think. Can it be the young of Raucaria. V. infrà. —

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[1] *Voyages dans l'Amerique méridionale* par don Felix de Azara, 1781–1801.

[2] *Dictionnaire classique d'Histoire naturelle*, Tome 1–17, 1822–1831; this and Tome 18 of *Dictionnaire des Sciences naturelles* are catalogued in the *Library of Charles Darwin*, 1908. [S. S.]

Caracara. (1294)

Called in la Plata " chimango " ; this bird is very [*beginning of large square bracket J*] [common on both sides of the continent, but does

J

not appear to extend so far northward [*added*] as the last species. It is found in Chiloe & on the coast of Patagonia,[1] & I have seen it in T. del Fuego. We have already remarked that it feeds on Carrion in company with the Carrancha ;[2] it is generally the last bird which leaves the skeleton, & may often be seen within the ribs of a cow or horse, like a bird in a cage. — The Chimango commonly frequents the sea coast, & the borders of lakes & swamps, where it picks up small fish. — Is truly omnivorous, & will [even *added*] eat bread, when thrown out of a house

MS. 38

with other offal ; [& *del*] I was [assured, that in Chiloe, they materially injure the Potatoe crops. by stocking up the roots when first planted. In the same island, I myself saw them, by scores following the plough & feeding on worms & larvae of insects. — I do not believe they ever kill birds or animals ; they are more active than the Carranchas, but their flight is heavy ; I never saw one soar. — are very tame, — are not gregarious — commonly perch on stone walls & [trees *del*] posts [added & not upon trees. — frequently utter, a gentle, shrill scream.] [*End of large bracket J*.]

Caracara (1882)

(1932.33). — N. Zelandae. —

L

[*Beginning of large bracket* L.] [[This bird is exceedingly numerous over the whole of the Falkland Islands. — I am informed by the Sealers, that they are found on the Diego Ramirez rocks & the Defonson isles,[3] but never on the mainland of Tierra del Fuego. — Nor are they found on Georgia or the more southern Islands. — It appears, that in this part of the world, the Caracara N. Zelandae, has, doubtless for some good cause, chosen the Falklands for its metropolis. In many respects, this Caracara resembles in its habits the Carrancha ; they live [chiefly *del*] on the flesh of dead animals & marine productions ; in the Il Defonso Isds & Ramirez rocks, their whole sustenance must depend on the sea ; They are extraordinarily tame & fearless & haunt the neighbourhead of houses for the offal ; if a [hunting *added*] party kills an animal, a number soon collect & patiently wait [sitting *del*] standing on the

MS. 38(a) *verso*

ground on all sides. (a) After eating, the uncovered craw is largely protruded, giving to the bird a disgusting appearance. — They readily attack wounded birds ; a cormorant in this state having taken to the

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[1] " further south, at Port Desire & the valley of S. Cruz. (⸮ in Patagonia is it not rather a small variety 1772 ?) " [lightly deleted].

[2] Altered from : " I have already said it feeds on Carrion together with the Carrancha."

[3] Diego Ramirez rocks are about 100 kilometres south of Cape Horn, and the San Ildefonso islands further west.

shore, was immediately seized on by several [of] these birds, who by
blows tried to hasten its death. — The Beagle was at the Falklands |
MS. 39 only during the summer, but the officers of the Adventure, who were
there in the winter, mentioned many extraordinary instances of their
boldness & rapacity — the sportsmen, on shooting excursions, had
difficulty in preventing them seizing the wounded geese, before their
eyes; they actually pounced on a dog which was lying close by fast
asleep. — It is said that several together will wait by the mouth of a
rabbit hole, & when the animal comes out, will together seize on him.
Constantly they flew on board the vessel lying at anchor in the harbor;
& it was necessary to keep a [constant watch *del*] good look out, to
prevent the hide being torn from the rigging, & the meat or game from
the stern. These birds are very mischievous & inquisitive; they will
pick up almost anything from the ground; a large black glazed hat was
carried a mile, as was also the Bolas, or pair of balls used in catching
cattle. Mr. Usborne experienced during his survey a more severe loss,
in a small Kater's compass in a red Morocco leather case, which was
never recovered. — These birds are moreover quarrelsome & very
passionate, tearing up the grass with their bills in their rage. Are not
truly gregarious; flight heavy, clumsy, do not soar; on the ground
run with extreme quickness very much like a pheasant; The Gallinazo
runs in the same manner. They are noisy, uttering several sorts of harsh
crys; one of which is [very *del*] like that of the English rook. — Hence
the Sealers always so call them. — It is a curious circumstance |
Maldonado that when crying out, they throw their heads upwards & backwards
MS. 40 after the same fashion as the Carrancha. They build on the rocky cliffs
on the sea coast, but only in the small islets & not in the two main
islands; this is an odd precaution in so tame & so fearless a bird. The
Sealers say the flesh of these birds is very good to eat, & when cooked
L quite white. —] [*End of large bracket* L.] Specimen (1932) (unfortu-
nately injured) [*added later*] agrees with the specific description in the
Dic: Class: legs & skin about beak bright " dutch Orange " beak " ash
grey ": thighs rufous &c &c; female; eggs in Ovarium size of goose
shot; — Specimens with legs, plumage, &c coloured as the description
in Dic: Class: are in *extremely small proportion* to some others;
Specimen (1882) is one such, this however appears to be a young bird
[feathers growing; *added*] there are however others (of which Capt.
F. R. [*FitzRoy*] & Mr. Bynoe have specimens) colored precisely in the
same way, differing only in proportional length of wing feathers & in
the skin about the beak being quite white [& beak itself nearly black
MS.40(a) *added later*]. (a) There is a specimen of the wing, of what I consider the
verso old cock bird. — The Gauchos (who are excellent practical naturalists)
state that all the yellow legged rufous thighs specimens are females
(which agrees with the one dissection) & all the grey legs males: It

must moreover be remarked that the latter are smaller in size than the
yellow legs. — Specimen (1933) is remarkable, bones were rather soft,
but feathers complete ; is, like to the old female in being of larger size ;
thighs & under parts of wings partly rufous, feathers of neck same shape ;
[as in old female ; *added later*] back blacker ; tail without bands ; soles
of feet slightly yellow, legs ash-coloured ; skin about beak, with yellow
MS. 41 margin ; beak lower | mandible grey. upper black & grey. — generative
organ quite smooth. — I think from this description there can be little
doubt but that this was a young female. — 1932 old female. — 1882
young male & Capt. F. R. old male. — It must be observed this will
account, (& I see no other way) for the very small numerical proportion
of the yellow legs ; a fact which at first to me was most perplexing. —
These circumstances appear to me very curious. — I have omitted to
remark that (1933) ♀ must be more than one year old, being shot in
Autumn. (April corresponding to October) & clearly not that years
bird : it is probable they do not attain full [size *omitted*] at least till two
years old. — Naturalists appear to have considered all the grey-legs as
young birds.

Caracara (2029). (Raucanca ?)

Specimen female ; I do not believe the male is essentially different in its plumage, for I saw several pair[s] such as this together. — Skin about the beak yellow, bill blue, with black lines ; legs pale yellow. — This bird was shot near the last at S. Cruz ; Lat 50°. in Patagonia, it was there very rare, but following up the river I saw several of them. On the West coast I never saw another specimen, & it was with a good deal of surprise, that in Northern Chili (Lat 30°), in the deserts, which extend between Coquimbo & Copiapo I again saw this bird. — I do not believe they are ever in Chili seen South of Coquimbo ; they were in no part numerous, but mostly so in the valleys of Guasco & Copiapò. — This handsome bird, — from what little I saw of its habits, appears to resemble the Carrancha ; it is however much shyer : is generally seen in pairs. — At S. Cruz I saw it with the other Caracaras, waiting till the Condors had finished their feast on a carcase. — |

MS. 42

Caracara. (3297. 3298)

I have never seen this bird anywhere but in the Archipelago of the Galapagos, where it is excessively numerous. — These islands, consisting of a pile of recent Volcanic rocks, are extremely arid & sterile ; the soil is almost everywhere covered by thin leafless underwood. In their ornithology are evidently connected with S. America, although 500 miles from the nearest shore ; they are situated under the Equatorial line : — This Caracara, in most of its habits resembles the C. N. Zelandae ; it is extremely tame & fearless ; frequents houses ; when in the woods a Tortoise is killed, these birds directly congregate, & remain waiting on the surrounding lumps of lava or stunted trees till their feast commences. — They will eat, almost anything, are said to kill chickens & young doves, & are very destructive to the little Tortoises, when they first leave the shell. Flight neither elegant or swift ; but on the ground possess like the C. N. Zelandae the power of running quickly. are noisy, utter many different crys, one very like that of the C. chimango. — Build in trees. — Specimen (3297) is Cock bird ; & 3298, young female ; Mr. Bynoe has old female, (with eggs in ovarium very large) ; these latter may be known, by their breasts being a much darker brown. — Exactly as in the Falkland Isd. these old females are in very small proportion to the others. At the tents, one day I think 30 were counted on the neighbouring hill & bushes, without one with the dark brown plumage. These birds were then (October) beginning to lay ; therefore specimen (3298) must have been at least one year old. — |

MS. 43 *Caracara* B To conclude with the foregoing birds ; however they may be arranged from external characters ; they all (B) possess one family air, and[1] agree in habits with the Vultures in the following respects ; in living chiefly on the flesh of dead animals ; in quickly congregating at any spot, where an animal may have died ; in gorging themselves till their craws protrude ; in their tameness, or boldness with respect to mankind, but cowardice to other animals. They are allied to true hawks. in venturing to attack young or wounded birds, — However they may be ranked, they supply to S. America in the economy of Nature the place of the Crows. Ravens. Magpies &c of England. —

Vultur aura. (1915). female. —

This bird has a wide geographical range ; is found in T. del Fuego, on the mountainous western coast of Patagonia, (but not on the dry plains of Eastern Patagonia) in Chili, where according to Molina, it is called Jote, & in Peru, at least as far as Lima. — Differently from the Caracara vulgaris & chimango it has found its way to the Falk-
M land Islds. — [*Beginning of large bracket* M.] [It may be at once recognised at a long distance, by its lofty, soaring, most elegant flight.
MS. 43(a) *verso* (a) They are solitary in their habits or at most go in pairs.[2] It is well-known to be a true carrion feeder ; on the west coast of Patagonia amongst the thickly wooded islets & broken land, it must live exclusively on what the sea may throw up & on dead seals ; wherever a herd of these animals are sleeping on the rocks, there may be seen these Vultures.]
M [*End of large bracket* M.] In the Falklands this bird is tolerably common. — I may mention that at Port Louis, not having seen any of these birds for some days, one morning a considerable number appeared,
MS. 44 so as to lead one to suppose they move | in bodies. They were here

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[1] " possess one family air and " added as note B on separate page.

[2] " They are solitary in their habits or at most go in pairs." Added as note (a) on reverse of page. The " a " in script and margin is lightly crossed out, but not the note itself.

shy. — In this female specimen, skin of head scarlet & " cochineal red " iris dark coloured. —

Cathartes atratus. or Gallinazo. —

This bird differs from the last species, in never, as far as I have seen going to the Southward of 40°. — It prefers a humid climate or rather the neighbourhead of fresh water; it is abundant in Brazil & la Plata. On the [dry & *del*] arid plains some way South of la Plata they never are seen, but nevertheless reappear on the banks of the Colorado. They extend across the Pampas, to the foot of the Cordillera, but, in Chili, I never saw or heard of one, although in Peru it is well known they are preserved in the streets as Scavengers. [*Beginning of large bracket* N.]

N [These birds may certainly be called gregarious; they seem to have pleasure in society, & are not solely brought together by the attraction of a common prey. On a fine day a flock may often be seen at a great height; each bird, wheeling round & round, without closing its wings in the most graceful evolutions. This is clearly done for sport-sake, without any further end, without it is connected with matrimonial

N alliances. —] [*End of square bracket* N. *Note* (*a*) *added on reverse of*

MS. 44(a) *page*, 44*a*, *and lightly deleted*.] On the ground, they can run very quickly

verso after the manner of poultry in a farm yard. —

Condor[1] The Condor is well known to have a wide geographical range, being found on the west coast of South America from the St of Magellan through-

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[1] The pages on the condor are amongst the most corrected and recorrected of any in the Ornithological Notes, with a duplication of p. 46 in the MS. The bird had captured Darwin's imagination, so that not only the range of its distribution, life history and habits are discussed, but its powers of sight and smell are examined on his own and others' evidence. There are two major deletions, themselves heavily corrected. Notes 44 (a), and 45 (a), given above in the main text are the final states of the original writing; I give here as a footnote the first deleted drafts for comparison.

MS. 44, " On the shores of Patagonia the most northern point, where I either saw or heard of these birds [their presence *del.*] was at the steep cliffs near the mouth of the R. Negro in Lat 41°. At this place they have wandered, about 400 miles, from their |

MS. 45, " most congenial habitation, of the Cordillera; [in the Andes. *del.*] At St. Joseph's bay I saw a pair sitting on the edge of the sea cliff "—not deleted, but not included in final texts. " Again further South at Port Desire, at the head of the deep Bay, where the rocks of Porphyry form bold precipices we see the Condor, of which a few stragglers occassionally visit the sea, coast. At the mouth of the S. Cruz, there is a line of cliff, frequented by these birds; following the course of the river inland, at about 80 miles distance, the sides of the valley are formed by precipices of basaltic lava; Here immediately the Condor appeared in numbers, although, in the space intermediate between these and the sea cliffs, not one had been seen. From these facts, & from not seeing the Condor, in other parts of the coast, where there are not precipices, it would appear that the presence of this bird is here partly determined by the occurrence of such mural precipices." End of first major deletion.

It is of interest to note that the lines of enquiry Darwin followed up later in the *Journal of Researches* and in the *Zoology of the Beagle*—and in his evolutionary work—often found their germinal suggestion in the small pocketbooks he carried with him on his inland expeditions. On the boat journey up the valley of the S. Cruz river, under the date April 23rd, 1834, is the entry: " Condor is present solely where mural escarpments." In September, 1834 he wrote: " Have seen but few Condors — yet this morning 20 together soaring about. Man said at once probably a lion . . . " In July, 1835 he notes: " Smelling properties discussed of Carrion Crows, Hawks. Magazine of Natural History.". Again in July, 1835, he observed their flight: (See second deletion). " Condors flight, close wings — remarkable motion of head & body — "

out the [whole *del*] entire range of the Cordillera. (a) On the Patagonia
shore, the steep cliff near the mouth of the Rio Negro in Lat 41°. was
the most northern point where I ever saw these birds or heard of their
existence. They have here wandered about four hundred miles from
the great central line of their habitation in the Andes. Further south
MS. 45(a) also, amongst the bold precipices which form the head of [the deep
creek of *del.*] Port Desire they are not uncommon ; yet [but only *del.*]
a few stragglers occasionally visit the sea coast. A line of cliff near the
mouth of S. Cruz is frequented by these birds, and about eighty miles
up the river, immediately that the sides of the valley [are *del.*, were
del.] are [*replaced*] formed by steep basaltic precipices the condor [as
I have already said *del*] is again found, although in the intermediate
space not one had been seen. — From these [and similar *added*] facts,
[and from the absence of the Condor in some other parts of the coast,
where the land was not abruptly broken, *del*] the presence of this bird
appears to be chiefly determined by the occurrence of perpendicular
cliffs. |

MS. 45 In Patagonia the Condors, either by pairs, or many together, [collectively
del] both [nightly *del*] sleep & breed on the [same *added*]
overhanging ledges. — In Chili however, during the greater part of the
year, they haunt the lower Alpine country [of *del*] nearer to the shores
of the Pacifick, & at night, several [together *del*] roost in one tree ; but
during the early part of summer they retire to the most inaccessible
parts of the inner Cordillera, there [(as it is said) *del*] to breed in peace. .
— With respect to their propagation, I [am *del*] was told by the country
people of Chili, that the Condor makes no sort of nest, but [in the
months of November & December *added*] lays two large white eggs on a
shelf of bare rock ; at S. Cruz & P. Desire, in vain I tried to discover
[find *del*] the nest, amongst the cliffs, where the young ones were then
MS. 46 standing. | I am assured the young Condors cannot fly for the first
whole year. — At Concepciòn, on March 5th [corresponding to our
September *added*] I saw a young Condor, which in size, was but little
inferior to an old bird, but was covered over its whole body by down
[precisely like that of a Gosling — excepting in being *del.*] of a blackish
colour, but otherwise just like that of a gosling. — I feel sure, this bird
could not [would not have been able to *del.*] have used its wings for
flight, for many months. — After the period when the young birds can
fly & apparently as well as the old ones [birds *del*] it would appear, from
what I more than once observed [in Patagonia *added*] that they yet
remain, both roosting at night on the same ledge [of rock *del*] & by day
hunting, with their parents. — Before however the ruff round the neck
[s *del*] of the young bird [s *del*] is turned white, [they *del*] it may often
be seen [independent *del*] hunting by itself. At the mouth of the S. Cruz,
during a part of April & May, two old birds every day were either perched
on certain ledges, or sailing about with a single young bird, which

though full-fledged, had not its ruff white. [*altered from* : . . . young bird, full-fledged; but the ruff not white.] I can feel no doubt, especially when recollecting the state of the Concèpcion bird [only one month previously *added*] that this young Condor had not been hatched from an egg of the same summer. And as there was no other young bird, it seems [is *del*] probable that the Condor only lays once in two years.[1] (?) In Patagonia, these birds, generally [very frequently, as I have said *del*] live by pairs ; but amongst the inland basaltic cliffs, I found a spot [place *del*] where scores must usually haunt ; on coming suddenly on MS. 46(a) the brow of the precipice, (a) it was a fine sight to see between twenty or thirty of these great birds start heavily from their resting place, and then wheel away in majestic circles. — [*Corrected from* : — upwards of MS. 46XXX twenty took flight & magnificently soared away.] | From the quantity of dung on the rocks, they must long have frequented this cliff [spot *del*] & probably they both breed & roost there ; — Having gorged themselves [full *del*] with carrion [*added*] on the plains below, they retire to MS. 47(a) these favourite ledges to digest their food. — (a) From these fact[s] we must to a certain degree consider the Condor, like the Galinazo, a gregarious bird. [*Corrected from* : Hence the Condor must be considered to a certain degree, a gregarious bird.] They are neither shy nor wild ; in this part of the country they exclusively prey on the guanaco, which either have died a natural death, or, as more commonly happens, have been killed by the pumas. — I am inclined to believe from what I saw in Patagonia, [contrary to the common supposition *del*] that they do not on ordinary occasions[2] extend their daily excursions to any great distance[3] from their regular sleeping places. — The Condors, may oftentimes, be seen at a great height, soaring over a certain spot ; in the most graceful spires & circles, on some occassions. I feel sure, they

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[1] This question of the reproduction of the condor went through changes in the two editions of the *Beagle*, and again in the *Zoology of the Beagle*. The above passage, with its evidence of the prolonged juvenile state of the young bird, is given in *Beagle*, 1839, p. 220, but is much shortened in *Beagle*, 1845. In *Zool. of Beagle*, 1841, Darwin quotes M. Alcide d'Orbigny as contradicting the statement that the young birds cannot fly for the first whole year. *Voyage dans l'Amerique Méridionale* par A. d'Orbigny, 1835–47. On p. 93, *B.* 1845, Darwin gives in a footnote his appreciation of this work, and says : "When at Rio Negro, we heard much of the indefatigable labours of this naturalist. M. Alcide d'Orbigny, during the years 1825 to 1833, traversed several large portions of South America, and has made a collection, and is now publishing the results on a scale of magnificence, which at once places himself in the list of American travellers second only to Humboldt."

[2] " Occassions " is here corrected by Darwin by crossing out one " s ". This spelling discovery was therefore made whilst he was writing up his condor notes. The double long s is still written in the first drafts wherever " occasion " or " occasionally " occur ; but in the later alterations the spelling is correct.

[3] " I suspect in Patagonia " [*altered from* : " I may doubt whether they hunt "] "they do not commonly hunt " [" I seldom saw them " *del*] " at a greater distance than " [more *del*] [beyond *added*] twenty miles . . . " this many times corrected passage was finally deleted.

do this for their sport, but on others, the Chileno countrymen will tell
you, that they are watching a dying animal, or the puma devouring its
prey: If the Condors glide down, & then suddenly all rise together,
the Chileno knows that it is the puma which still watches the carcase
& has sprung out to drive away the robbers. — Besides carrion, the
Condors frequently attack young goats & lambs; hence the shepherd
dogs are trained the moment the enemy passes over to run out, and
looking upwards to bark violently.[1] The Chilenos destroy & catch
MS. 47 numbers; | two methods are used, one is to place a carcase within an
enclosure of sticks on a level piece of ground, & when the condors are
gorged by galloping up on horseback to the entrance thus to enclose
them. For this bird, not having space to run, cannot give its body
momentum sufficient to rise from the ground. — The second method is
to mark the trees in which they roost, frequently to the number of
five or six together, [*corrected from*: in which the Condors frequently
to the number of five or six together, roost,] & then at night climb up &
noose them; they are such heavy sleepers, as I have myself witnessed,
that this is noways a difficult task. — At Valparaiso, I have seen a
living Condor sold for sixpence, but the common price is eight or ten
shillings; — One which was brought in, had been lashed with rope &
was much injured, but the moment the line was cut by which its bill
was secured, it began, although surrounded by people, ravenously to
tear a piece of carrion. — At the same place in a garden, between
twenty & thirty were kept alive; they were fed only once a week &
MS. 47(a)* *verso* appeared in pretty good health. (a)*[2] I noticed [& was told it was of
general occurrence *inserted*] that several hours before any of the Condors
die; all the lice with which they are infested crawl to the outside [of the
del.] feathers. — [Ricinus (2153). — *del.*]
The Chileno countrymen [Guassos *del.*] assert, that the condor, will live
& retain its powers, between five & six weeks! [without eating *added*]
I cannot answer for the truth of this, but it is [a likely enough although
del.] a cruel experiment, which very likely has been tried.

When an animal is killed in the country, it is well known that the
Condors, [altered to condors] like other Carrion [altered to carrion]
vultures, gain the intelligence & congregate in an inexplicable manner.
In most of these cases, it must not be overlooked, that the birds have
MS. 48 discovered [collected *del.*] their prey and | have picked the skeleton
clean, before the flesh could have been in the least tainted. Remembering
the opinion of M. Audubon on the little smelling [olfactory *del.*]

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[1] Corrected from: "hence the shepherd dogs are trained to run out & bark violently upwards, the moment the enemy passes near."

[2] The asterisk in the text indicates that Note 47(a) was to be given as a footnote in the Journal. See *B*. '39, p. 222, and *B*. '45, p. 184. The form is slightly altered; "I was assured that this always happened." comes at the end, and "Ricinus" and the number are omitted.

powers of such birds, (b)*[1] I tried, in the above mentioned garden, the following experiment. The condors, were tied, each by a rope, in a long row at the bottom of a wall. — Having folded [folding *del.*] a piece of meat in white paper I walked backwards & forwards, carrying it in my hands, at the distance of three yards. No notice was taken, I then threw it on the ground within one yard of an old cock bird, he looked at it but took no further notice. — With a stick I pushed it [still *del.*] closer; [& closer, *added*] the Condor [at last *added*] touched it with his beak, & then instantly with fury tore off the paper. at the same moment, every bird in the long row was struggling & flapping its wings. Under the same circumstances, it would have been out of the question, to have deceived a dog. | MS. 48(a) *verso* (a) I may remark, that it has often happened to me, when lying down to rest on the open plain, [country *del.*] that on looking upwards I have seen carrion hawks, sailing through the air at a great height. Where the country is level [commonly *del.*] I do not believe, a space of the heavens of more than 15° above the horizon is commonly viewed [beheld *del.*] with any attention, by a person either walking or on horseback. If such is the case & the Vulture is on the wing at a height of between three and four thousand feet, [*altered from figures*] before it could come [would fall *del.*] within the above range of vision, its distance in a straight line from the beholder's eye would be rather more than two British miles. — Might it not thus readily be overlooked? When an animal is killed by the sportsman in a lonely valley, may he not all the while be watched from above by the sharp-sighted bird? And will not the manner of its descent, proclaim throughout the district to the whole family of carrion feeders, that their prey is at hand? [*The following passage is scored through by two vertical lines, but I give it in the main text as it contains material not given elsewhere.*] Amongst all these Condors, I noted the following circumstance, that the hens have bright red eyes, but the cocks yellowish brown. In a specimen, which at S. Cruz, I knew by dissection to be a female the same color was observed. A young bird (which however, it being Spring-time, must have at least been one year old,) whose back was still brownish & ruff not white, had its eyes *dark* brown; upon dissection after death, this young bird turned out to be a female. — The young male has its back & ruff brown & the comb on head simple. — It is rather singular, that in Chili, the old birds, are MS. 49 known amongst | the country people, by the name of " El Buitre " or the Vulture; whilst those alone, without the white ruff, are called Condors. — Molina says that the proper Indian name is Manque. [*End of scored passage.*][1]

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[1] The asterisk again indicates a footnote for the Journal. In *Beagle* '39, 222, the footnote is taken almost verbatim from note MS. 48(b), which reads as follows:

(b) " In the case of the Vultur aura, Mr. Owen, in some notes read before the Zoological Society, has demonstrated from the developed form of the olfactory nerves, that this bird must possess an acute power of smelling. It was mentioned on the same evening, that on two occasions, persons in the West Indies having died & their bodies not being buried, till they smelt offensively, these birds had congregated in numbers on the roof of the house. This instance appears quite conclusive as it was evident they had gained the intelligence by the powers of smell, and not of sight." [*Altered from*: " In this instance vision could not have helped ... "] " It would appear from all these facts, that carrion feeding hawks possess both the sense [*altered from* power] of sight and smell in a high degree." End of MS. 48 (b).

In *Beagle* '45, p. 185, the discussion is given in the main text, as Darwin had received further evidence against the acute sense of smell of the turkey-buzzard and gallinazo. The date of Owen's communication to the Zool. Soc. was 14th March, 1837, and Darwin was present. Owen's information about the olfactory nerves of the vulture was given in a letter to Mr. Yarrell, the secretary. It ends: " The above notes show that the vulture has a well-developed organ of smell; but whether he finds his prey by that sense alone, or in what degree it assists, anatomy is not so well calculated to explain as experiment."

The date of the meeting proves that Darwin added note MS. 48(b) to the main text after March 1837.

When the Condors in a flock are wheeling round & round any spot, it is beautiful to observe the manner of their flight. Excepting when rising from the ground, I do not recollect ever having seen one flap its wings. Near Lima I watched several of them, for quarter & half an hour, without once taking off my eyes; they moved in large curves, sweeping in circles, descending & ascending without once flapping. [flapping, *del*; closing their wings, *del*; flapping *added*.] As some of them glided close over my head, I intently watched, from an oblique position, the separate & terminal feathers of the wing; if there had been the least vibratory motion, the outlines would have been blended together, but they were seen distinct against the blue sky. The head & neck were moved frequently & apparently with force; & it appeared [would *del.*, seems *del.*] as if the extended wings formed the fulcrum on which the movements 49XXX of the neck, body, & tail acted. | [*Insertion XXX*] If the bird wished to descend, the wings were for a moment collapsed; and then when again expanded with an altered inclination, the momentum gained by the rapid descent, seemed to urge the bird [body *del.*] upwards, with the easy and steady movement of a paper kite. In the case of any bird soaring, it must have sufficient rapidity of motion, so that the action of the inclined surface of the body on the atmosphere may counterbalance its gravity. The force to keep up the momentum of a body moving in a horizontal plane in that fluid (in which there is so little friction) cannot be great, & this force, is all that is wanted. The slight movements of the neck and body of the condor we must suppose sufficient for this. [*Altered from*: Must not the slight movements of the neck and body of the condor be sufficient for this?] However this may be, it is truly wonderful and beautiful to see so great a bird, hour after hour, without any apparent exertion wheeling and gliding over mountain and river.[2] —

[1] See *History of Chili* by the Abbé Don J. Ignatius Molina, 1809, Vol. I, p. 220.

[2] The remainder of MS. 49 and all of MS. 49 (a), have rough drafts for the above inserted passage on p. 49XXX, which remains with very slight alterations in *Beagle* '39, p. 223, and in *Beagle* '45, p. 186. I give the deleted rough drafts here; the last phrase, on the bird taking advantage of all air-currents, sounding so familiar to our more air-minded ears, is not found in the remodelled version. " . . . these movements happen in a perpendicular as well as in a lateral direction; by the former the inclination of the whole extended surface of the bird, with the horizon, is at once altered; this, acting with the

[*End of insertion XXX*. The writing can just be discerned here through a huge blot.] |

MS. 50 N.B. I will here add a few trifling observations on some well known birds at the Falkland Isds. —

M. Lesson states, that three sorts of Penguin are found amongst these Islands. Capt. FitzRoy has a fourth species, which I have seen also in the St. of Magellan.

Penguin One day I was much amused by watching the manners of P. demersa, having placed myself between it & the water. — It is a brave bird; till reaching the sea he regularly fought & drove me backwards. Nothing less than [a] heavy blow could have stopped him; every inch gained he kept, standing close before me, erect & determined. — When thus opposed, he continued to roll his head from side to side; as if the power of distinct vision lay in the anterior part of the eye, and only in a plane, horizontal with respect to the usual position of the head. [bird *del.*] This bird is called the Jackass Penguin, from when on shore, throwing its head backward & making a loud strange noise, very like the braying of that animal. When at sea, & undisturbed, its note is very deep & solemn, & is often heard in the night time. When diving it uses its little wings with great rapidity; and when on shore, crawling through the tussocks or on the side of a grassy cliff, it likewise uses them as front legs. — In such situations its motions are so quick, as to resemble in a singular manner, some small quadruped. — On the open ocean, this bird with its low figure, its easy motion & crafty appearance, may be likened to a Smuggler. —

Steamer A logger headed duck, called by the old navigators race horses, and now steamers, has often been described from its extraordinary manner of MS. 51 splashing & paddling over the water. | They here abound in large flocks. In the evening when preening themselves, they make the very same mixture of noises, which bull-frogs do within the Tropics. — Their heads are remarkably strong, so much so, that actually I had difficulty in breaking it with my heavy geological hammer: the beak is possessed of corresponding strength; a structure which must well fit them for their mode of subsistence; this judging from their dung must almost exclusively consist of shell fish obtained from the Kelp, & from the shores at low water. They enjoy but little power of diving. They are extraordinarily [(as all our sportsmen can testify) *del.*] tenacious of life,

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momentum gained by a rapid descent, appears to cause the bird to rise, like a paper kite, with an even & steady motion. In case of a Condor soaring, the bird must have sufficient rapidity of motion, so that the action of the inclined surface of the body on the atmosphere may counterbalance its gravity — The force to keep up the momentum of a body moving in a horizontal direction in that fluid (in which there is so little friction) cannot be great; This force is all which is wanted: — must not the movements of the neck and body be sufficient? The bird also doubtless takes advantage of all currents in the air. — "

A further version of the early section is given on p. 49 a. " In the midst of a rapid descent it will thus alter the inclination of its extended surface, & this acting with the acquired momentum, seems to force its whole body to rise, with an even and steady movement like that of a paper kite. "

& as all our sportsmen can testify, very difficult to kill. — Mr. Stokes once shot one, near Chiloe which weighed 22 lb. — Trachea (545) Spirits.

Goose MS. 51B *verso* The Upland goose is common in pairs. & Small flocks of half a dozen; throughout the island. (B). Trachea in spirits (904) & (576.577 Cock & Hen). — N.B. Trachea. (& worms from stomach of Diomedia exulans (817). — They do not migrate, but build on the small outlying islets; this is supposed to be from fear of the Foxes, & it is perhaps from the same cause, that these geese, though exceedingly tame by day, are shy & wild in the dusk of the evening. — It lives entirely on vegetable [matter] and is very good eating. —

Goose (rock) The rock goose (Anas hybrida of Molina) is common here, in T. del Fuego, & on the west coast as far as Chiloe. These birds invariably go in pairs. — In the deep & retired channels of T. del Fuego, the snow white Gander & his darker companion, standing close by each other, on a distant rocky point, form a marked feature in the landscape. —Trachea

MS. 51(a) *verso* (508) in Spirits | (a) This goose lives & feeds exclusively on the marine productions of the shore.

1834 The black-necked swan is an occasional visitant to the Falklands. — |

S. Cruz. Lat 50°.
MS. 52

2004 Feathers of Avestrus Petise, high up S. Cruz. Vide infrà

2011 cop Callandra. — see suprà. No ? (1216). — S. Cruz

2012 cop Lanius; rare [unless ? *del.*] both on coast & in the interior plains; chaces insects very quickly half flying, half running. — do

2013 cop Lanius. — rare. — female. — Hab. do. — N.B. One of these birds is brownish with a white tail; I saw it in the lofty & arid valleys on the Eastern slope of the Cordillera at Chili. — The other of these, or one shot at P. Desire or St Julians, is brown all over & with a broarded[1] bill like true Lanius, this bird is found also in Chili as far North as Copiapò. I am assured that it commonly kills young birds. —

2014 cop Hawk. female, flutters stationary over a spot like the Kestril; wide range, being found on the west coast as far as Lima. — S. Cruz

2015 Fringilla (cock ?), frequent the bushy valleys in small flocks from six to ten, are not common. — I only saw them in one other part of Patagonia at St Julian's Bay. — They utter a very peculiar & pleasing note; sometimes they move from bush to bush with an odd soaring flight. — I saw this bird in the valleys of the Cordillera of central Chili, at height which must have been about 8000 ft. near to the upper limit of vegetation. — (B) [*added on reverse of page*] & rarely in the low country of Chili.

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[1] Probably intended for " broader ". The extra r in broad, neighbourhead for neighbourhood, besides the long double s in occasion and occasionally, were amongst the constant early spelling mistakes when writing his Diary during the voyage. In the last of the small pocket books (See *Beagle*, 1945, p. 252,) Darwin lists the needed purchases in the next town,—probably Cape Town, for use in the last lap home. These include "12 of the little Quires from the Captain—Inkstand, pencils, Blotting paper. Bramah pens, common do." Also a spelling Dictionary. These acquisitions prove how occupied he was in writing up his notes whilst still on board. See *Diary* 1933, p. XIX.

2016 do. — female. Hab. do.
2017. Fringilla. — Cock — abundant in valleys near coast & in the interior country. — Hab. do. S. Cruz.
2018 do. — female — do.
2019. Fringilla cock — rare — do.
2020 (a) Red throated creeper male; MS. 52(a) *verso* In the lofty, arid valleys of the Eastern slope of the Cordillera of central chili his bird is found. — N.B. (I call these & following birds creepers, without meaning to say, they have habits of *true* creepers; they hop actively about the thickets & herbage of the most wooded but sterile valleys.)

MS. 53 When I call these small birds males, I do so because | the generative
N.B. organs, even with aid of lens did not appear granulated. Anatomists
S. Cruz will know how far this is subject to error. —

2021 cop Creeper not uncommon, amongst the thickets
2022 cop Creeper (long tailed): male: do. S. Cruz
2023 cop — —
2024 cop Creeper; male: — do —
2025 cop (a) Furnarius. — female. — not common: flies about under the bushes, & cocks up its tail; quickly reiterated cry do
MS. 53(a) *verso* Is found on Eastern Cordillera with Creeper 2020 V.

2026 cop Wren. — female. — harsh chirp. —
2027 cop. Parus: female: by three's & four's together. — do
2028 cop Caracara Vide page 34, genus — do
2029 cop Caracara: female of Caracara — do
2030 cop Hawk legs pale yellow, bill blueish black — do
2031 cop Owl. — do
2080 Procellaria gigantea. Called by the English Nelly & by the Spaniards Quebranta huesos. — This bird was shot in Port Famine; I had long marked this black variety & thought it a different species. — But Mr. Lowe[1] (a person who for many years has from his business, been intimately acquainted with all these southern countries & their productions) assured me that it is the young of the common greyish black kind. — Besides the well marked distinction of color, the flight of this kind appears to me more elegant. Bill wax white; legs black, upper surface greyish. The Nelly is common over all the southern latitudes: she frequents the deep inland channels as well as the open ocean far from the coasts. Often settles & rests on the water. — In their flight & general appearance on the wing much resemble the albatross, & as they MS. 54 commonly frequent the same | parts of the ocean, it is probable their food is nearly similar. But in the case of either [both *del.*] bird, it is in vain to watch [them *del.*] to discern [?] on what they feed; [*added*] they

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[1] " Sunday [March] 24, 1833 . . . On Friday a sealing vessel arrived commanded by Capt. Lowe; a notorious & singular man, who has frequented these seas for many years & been a terror to all small vessels." Quotation from *Beagle Diary*, 1933, p. 141. Darwin had great faith in Lowe's observations.

appear to hunt the water in sweeping circles for days [together *added*] without [being seen to *added*] catch any prey. — The Nelly is carnivorous; *some of the officers of the Beagle, at Port St Antonio, saw one* pursue & kill a species of Coot. The latter tried to escape, both by diving & flying; but was continually struck down. — at last its fate was concluded, by a blow on the head, when rising from beneath the water. At Port St. Julians the Nelly was seen to kill young gulls. — This specimen, had in its stomach the bill of a large cuttlefish. — The Nelly breeds on the coast of Patagonia, on small islands, such as Sea Lion's Isld at S. Cruz. — The following notes may help to serve as comparison with the above specimen; is description of one killed at Maldonado, Rio Plata; appeared slightly to differ in colour from description of "gigantea" in (Manuel. d. o ?)[1] colour "greyish black", a shade darker above & one lighter beneath. — Extreme points of Tarsi (measured outside) 3·4 inch. — Fibulae, from centre of articulations 10·8. — Lower mandible from feathers to extremity 3·15. — Nose, measured on central part, from a membrane at base to concavotruncate extremity 1·65. — Depth of bill including nose 1·2 — retrices 16 in number. —

2081 cop MS. 55 Tyrannus; not uncommon, Port Famine; is found on west coast as far North as Copiapò in Northern Chili; sits generally perched on a moderately high twig looking out for its winged prey | Builds a coarse nest in bushes: egg (2375: iris scarlet: Specimen from Chiloe (2124). —

2082 Fringilla, in small flocks, feeding near the beach, — I never saw any before. — I do not believe the cocks (if this is not one) are brighter coloured. — Port Famine. June

2083 cop Tyrannus — do —

2084 Certhia. — Probably of all land birds in T. del Fuego, this is the most numerous; it is likewise common on whole wooded coast of the west, & is found even as far North as 60 miles south of Valparaiso, but there the dry country & stunted woods are not favourable to its increase. In T. del Fuego, throughout the forests of Beech trees, both high up, & low down in the most gloomy, wet & impenetrable valleys, this little bird is common. Its numbers no doubt appear the greater, from its habit of following, with apparent curiosity, every person, who enters these silent forests; continually uttering a shrill harsh twitter, it flutters from tree to tree within a few feet of his face. — It is far from wishing for the modest concealment of Certhia familiaris. — Nor does it, but seldom, run, like that bird, up & down the bark of trees, but, industriously, more after the manner of a willow wren, hops about & searches every twig & branch. —

2122 cop Alcido. female. This bird is abundant in T. del Fuego, in la Plata *(Brazil ?) & Southern Chili. This specimen came from the island of* Chiloe: its habits generally resemble those of the Europaean kind;

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[1] Refers to M. Alcide D'Orbigny's Manuel.

MS. 56[1] but both here & in Tierra del Fuego, its | common, if not universal places of resort, are the quiet coves & deep creeks of the sea. — In the stomach of this bird was a Cancer brachyurus & small fish. — I may here also add, that amongst the Chonos Islds Mr. Bynoe, shot a large eared Owl, the stomach of which was full of Decapod Crustaceae ! — Chiloe

2124 cop Lanius vide. (2081) do

2125 cop Turdus : male : this bird is found whole west coast. (la Plata ? [*added in margin*] Falkland Isd & in Chili to its Northern limits, is very common — feeds chiefly on seeds & berrys. Is said to have its nest smoothly lined with mud. I presume like our thrush. do

2126 cop Furnarius : male ? : Chiloe

2127 cop Myothera ; (female) called by the Chilotans, Cheucau. — is common in Chiloe, extends at least as far as 47° South, but further North than 37°, where the woody country ceases, it has not been seen. — This bird frequents the most gloomy & retired spots in the humid forests. At some times, although its cry may be heard, it cannot with the greatest attention by seen ; but generally by standing motionless, in the wood, it will approach within a few feet, in the most familiar manner. It busily hops, its tail vertically cocked upwards, amidst the impervious mass of rotting canes & branches. The gizzard is muscular, it contained, hard seeds, buds of plants & vegetable fibres, mixed with bits of stones ; in a specimen, killed further to the South, there were also, some scanty remains of insects. It is said to build its nest in low bushes or amongst
Chiloe July [*1834*] MS. 57 sticks close to the ground. — This bird is well known & held in superstitious dread, by the natives on account of the strange | & varied crys it utters : the most usual is a loud singular repeated whistle. — There are altogether three very distinct kinds ; one is called Chiduco & is an omen of good, another Huitreu which is unfavourable. These names are given in imitation of the sounds ; by which the natives are in some things, actually governed ! — The Chilotans have certainly chosen a most comical little bird, for their prophet. — Chiloe

2128 cop Muscicapa ; is here found always on the beach, expands its tail like fan.

2129 cop Creeper : female : runs up & down the trees, manners like Certhia familiaris ; Coleoptera in stomach ; is found as far North as central Chili, but is not there common ; is in Chiloe far from rare.

2130 cop Creeper : female : V (2084)

2131. — Fringilla. — Chiloe. —

MS. 57(a) *verso*

2132 }
2133 } Fringilla, — cock & Hen, shot together — Is found in numbers from Chiloe throughout Chili, at least as far as Copiapo. Was shot at the Rio Negro [*Added in margin*] But, as far as I am aware, has not crossed the Cordillera to the Eastward. In Chiloe it is perhaps the commonest land bird ; in small flocks, it frequents the cultivated ground & neighbour-

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[1] Added at top left-hand corner of page " 2123. Chiloe " and some illegible words.

head of houses ; in these respects & general habits very much resembles our sparrow. — In stomach generally seeds & sand. — Specimen (2320) will show its nest & eggs ; it was built on the trellis work of a vineyard in a garden, close by a frequented path, at Valparaiso. During time of incubation the male bird utters two or three pleasing notes, which Molina has exaggerated into a fine song. — Is called in Chili " Dinca ". — I should add, that this bird is not *exclusively* found near houses. — |

Chiloe. July. —
MS. 58
2134
2135

Trochilus (latter female by dissection ?) Is found on the West coast from Northern Chili to Tierra del Fuego, in which country it has been described, as seen sucking the flowers of a Fuschia in the midst of a snow storm.[1] In Chiloe it is exceedingly abundant, perhaps in number of individuals, it is scarcely exceeded by any other bird, excepting the Dinca. — This delicate little bird, uttering its very acute chirp, skips from side to side, amongst the dripping foliage, but it appears out of character in these climates of endless storms. In Chiloe, it commonly frequents open marshy ground, where the *Bromelias* in patches form dense thickets ;[2] on the edges of these, it may be seen hovering, & every now & then dashing into them, near to the ground, but whether it ever actually alighted, I could never observe. There were at this time of year scarcely any flowers, & none whatever, where the above plants grew. Hence I was well assured they did not live on honey ; on opening the stomach or duodenum, in a yellow fluid, by the help of a lens, I plainly saw numerous morcels of the wings of Diptera, probably Tipulidae. It is evident the Humming birds search these insects out of their winter quarters, amongst the thick foliage of the Bromelias. It is truly insectivorous ; In the stomach of one shot at Valparaiso, besides small Diptera, I found [*corrected from* : recognised parts] of Ants ; the contents were like what might be found in a Certhia. — Amongst the Chonos Isd. although at a time, when there were flowers on the outskirts of the MS. 59 woods, yet the damp recesses of the forest | were the favourite haunts. In the stomach of one shot here, there was a black mass of finely comminuted insects.[3] In central Chili, these birds are said to be regularly migratory. They make their appearance in the Autumn [of the year ; *del.*] the first I noticed was on the 14th of April, but by the 20th corresponding to our November, [*added in margin*] at Valparaiso they were numerous. Staying through the winter, in the Spring, they were still very numerous in August, from that time they gradually decreased, so that on Octob. 12th., in a long walk, only a single one was seen. — As this [small *del.*] species disappears, a larger kind arrives, which circumstance will be mentioned with the account of that bird. I do not believe this Trochilus breeds in any part of central Chili, for at the time, when they have migrated from that country, nests were common in Southern Chiloe & in the Chonos Isd. — Specimen (2425) shows nest & egg; on Decemb. 8th.,[1] eggs nearly Hatched, South end of Chiloe: a little further south in January, young birds. — This case of migration exactly agrees with what happens in N. America. Humming birds are said to migrate to the United States & Canada to avoid the heats of Summer, — Humbd. Vol. V Part I. P. 352. — On the West coast they likewise move in the same direction to Nootka Sound. Cook. 3rd Voyage. Vol II. — Our Trochilus, though migratory in one part, is a permanent resident in T. del Fuego. — In a like manner. Beechey[2] says that the Humming MS. 60 birds remain in Northern California all winter. — Amongst the | Chonos Islands in January, when there were young birds in the nest, a considerable number of specimens were shot; amongst these very few or scarcely any had the usual shining head of the Cock bird,[3] yet on opening their bodies, many appeared to be of that sex. Specimen (2503) is in this case; it may be observed to have a yellow gorge, & I have seen some specimens with light brown feathers on their backs. — Is it a distinct species? It is certain they cannot be young birds. From the proportional numbers & dissection I do not think they can all be hens, although [birds *del.*] in [*added*] that sex the glittering feathers on the head are never present. Are the cocks moulting?

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[1] See Capt. King, *Voyage of Beagle* '39, Vol. I : 127.

[2] Note added on reverse of page, 58 (a). " These plants are not Bromelias ; they bear a fruit like a pineapple ; have strong recurved leaves armed with strong hooks ; these spring from a woody stalk. It is called some name like Pophos ? — " Bromelia is mentioned in *Beagle* '39, but omitted in *Beagle* '45. The identity of the plant does not seem to have been determined.

[3] From " on opening the stomach " eleven lines back, MS. 58, one faint vertical, and a few wavy horizontal erasures have been made. Also two crosses in margin. Yet the substance of the passage remains in both *Beagle* '39, pp. 330–331, and, somewhat curtailed, in *Beagle* '45, pp. 271–272. The re-writing of the passages is very considerable, showing that the O.N.s were still only rough drafts.

Trochilus: (2179 [female *del.*]). (2180 male). —

I saw this bird in the middle of August in Valparaiso: it was stated that it had then shortly arrived, & certainly by the month of September its numbers were much increased. — On the wing its appearance is singular; like others of the family, it moves from place to place, with a rapidity & manner, which may be aptly compared to that of Sirphus amongst the Dipterous insects. But when hovering over a flower, the motion of its wings is slow & powerful, so as not in the least to possess that vibratory movement, common to most of the species. Hence no humming noise can be perceived. — I never saw a bird, where the force of its wings, as in a butterfly, appeared so powerful in proportion to its MS. 60(a) *verso* weight. (a) I do not know whether this is intelligible; each time as it slowly flaps its wings, the body springs back from between the blows. —

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[1] This sentence to " young birds " scored in the margin, with a cross.

[2] Frederick William Beechey, 1796–1856, rear-admiral and geographer. President R. Geog. Soc., 1855. Wrote narrative of a Voyage to the Pacific and Beering's Strait . . . in His Majesty's Ship Blossom etc, 1825–8, London, 1831.

[3] Cross in the margin.

The expansion of the tail between each flap, appears both to steady &
support the bird. — Specimen in Spirits (1050) [*End of Note* (a).]
When hovering by a flower, the body is kept in a nearly vertical position,
MS. 61 & the tail is constantly expanded & shut like a fan. — | Although thus
flying from flower to flower, yet in its stomach there were abundant
remains of insects ; these & not honey must be the object of its search.
— Note very shrill. — As I have before said, this Trochilus takes the
place during the summer of the smaller species, which migrate to the
Southward to breed ; the object of this bird, must be similar, it doubtless
comes from the parched northern countries, & certainly uses Chili,
as its breeding place. Specimen (2319) is the nest. — In central Chile,
this bird is far from uncommon. —

MS. 61B I may mention that in the Cordillera of central Chili, I saw a humming
verso bird, at the height of about 10,000 feet & a little below the snow line. —
I am not sure of the species, but it had, I think, some white feathers
about the neck or body. —[1]

2136 cop Hawk. female. — Chiloe — July — [*1834*]

N.B. . . . Besides the birds already enumerated, I saw the Condor, 2 Caracara, Vultur Aura: Hawk 2014: Furnarii (1822 & 1823): Wren 1831. Sparrow 1826. — Certhia 2084 — Icterus 1784 abundant, — the black & scarlet headed woodpecker ; of these birds a few generally travel together, very noisy, crys singular, within forest. — Vanellus or Pteru pteru. — Myotherus 2531. — Rhyncops : Myothera 3436. — and many many water birds.

I may remark, that the ornithological character of Chiloe & Tierra
del Fuego ; although these countries are separated by twelve degrees
of Latitude, their climates are not very dissimilar ; in each, the whole
surface is covered, by one gloomy wet, & scarcely penetrable forest.
In Chiloe, although situated in so temperate a zone, the woods in some
respect partake of a Tropical character. Many different kinds of trees
are thickly placed together, on them vegetate numerous parasitical
plants, of which not a few are monocotyledenous — an arborescent
MS. 62 grass, or cane, intertwining the trees to the height | of 30 ft, forms
extensive & most impervious brakes. Many beautiful ferns, although
not tree-ferns, grow to a very large size and are abundant. — [*added as
Note (a) partly on verso of MS. 61 from " an arborescent grass."*]

Chile

2147 : 2148. Bones supposed to belong to the Avestruz petise picked up at St. Julian's. —

N.B. The following birds were shot at *Valparaiso*, during months of August &
September (*1834*). — The sexes were distinguished by S. Covington by

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[1] Note B on the verso of 61, is not given an exact place of insertion on the recto. For reference to Trochilus, see *Beagle*, 1839, MS. 330–332, and *Beagle*, 1845, MS. 271–272, where Note B is left out, and the whole reduced.

opening their bodies, & judging chiefly from the granulated state of the Ovarium: it being the Spring, probably this means is correct. —

2159 cop Partridge: male: In its general habits & appearance very closely resembles the Partridge of la Plata (1223). — namely in its manner of running openly — not readily squatting, — flight — going in pairs — flesh white — &c &c &c. — Nevertheless I am sure it is a different [form *del.*] species, from its whistle, when rising from the ground, being much shriller & of a distinct tone. It is tolerably numerous; — is not so easily caught, as those in la Plata. I never heard of these being here caught by men on horseback. —

Egg (2427). — An officer on board having some eggs from B. Blanca on the East coast, I carefully compared them. The general color & appearance is similar, being palish " Chocolate red ". The B. Blanca one, a shade paler; this one is also smaller. —

Diameter	Valparaiso inch	B. Blanca	Difference
Longer axis	2·070	1·815	·255
Shorter do	1,495	1·300	·195
Difference	0·575	0·515	·060

2160 Pidgeon: female: (large kind) —

2161 cop Woodpecker: male: is the " Pitui " of Molina. I think the name must come, from its curious note, which somewhat resembles that word. Frequents the dry hills, over which a few bushes & trees are scattered. . — Molina states that it builds its nest in holes in banks. — Is it same with that of Maldonado? |

MS. 63

Valparaiso—
August &
September
[*1834*]

2162 cop Owl: male:
2163 cop Dove: female. —
2164 cop Water Hen: male: Bill " grass & emerald green " iris scarlet
2165 cop Water Hen: female. —
2166 cop Plover. male: middle claw serrated.
2167 cop Lanius: female. —
2168 cop Snipe: female
2169 : cop 2170 cop Callandra (: 69 female : 70 male) (V.1216)

2171 cop Caprimulgus, male: utters at night a simple gentle, plaintive cry, which is regarded with much superstitious dread by the natives; frequents the hills.

2172 Myothera: female: (& 2296 & 2824 Coquimbo) Called by the Chilenos el " Turco ". It is not uncommon. — Lives on the ground, sheltered amongst the bushes & thickets, which are scattered over the dry &

sterile hills. With its tail erect, & stilt-like legs, every now & then it may be seen popping from one bush to another, with uncommon celerity. It really requires little imagination to believe the bird is ashamed of itself & is aware of its most ridiculous figure. — An ornithologist, on first seeing it, would exclaim, " a vilely stuffed specimen has escaped from a museum & has come to life again "! — Does not *run*, but hops. It cannot be made to fly, without much trouble. The various, loud cry's, which, when concealed amongst the bushes it utters, are as strange as its appearance. — Is said to build its nest, in a deep hole underground. — Gizzard very muscular; contained beetles, vegetable fibres & pebbles. — When I first examined this bird, I thought, from the length & strength of its legs, soft membranaceous covering to nostrils & muscular gizzard, it was a distant relation to the order of Gallinaceous birds. | [*Note* (*a*) *on verso of page* 63] Specimen (1039) in spirits for dissection |

Valparaiso
MS. 64
2173 } cop
2174 }

Myothera female: (& 2174). This bird is called by the inhabitants " Tapacolo ", or " cover your posterior ". The name is well applied, as it generally carries its short tail, more than erect, that is inclined backwards & towards the head. — It is very common; frequents the bottom of hedges & thickets, also the bushes scattered over the sterile mountains, where scarcely another bird exists. Hence this bird forms a conspicuous figure in the ornithology of Chile. In its general manners of feeding, of quickly hopping out & back again to the thickets, of preferring concealment, in its unwillingness to take flight, & in its nidification there is a close resemblance to the Turco. Its appearance however, is not quite so ridiculous as in that bird, & it may [be] said that in consequence, it [show *del.*] exposes itself with greater readiness. The Tapacolo is very crafty, it will remain motionless at the bottom of a bush, & will then, after a little time, try, with much address to crawl away on the opposite side. It is moreover an active bird & generally making a noise; these noises are various & strangely odd, some, are like cooing of doves, others like bubbling water, & many defy all similes. The country people, say it changes its cry, five times in the year; so that I suppose, they vary them according to the Season. [*Note* (*a*), *verso of MS.* 64.] Specimen in Spirits (1037) & (1052)] As far as I am aware, the Tapacolo & Turco are only found in central Chile; in their hopping powers they are well adapted to a country dotted over with bushes & thickets.

MS. 65
Myothera cop
(2825).
Valparaiso
August & Sept:

This species I first met with | at Illapel, about half way between Valparaiso & Coquimbo. — I do not believe it occurs further Southward, but in the desert country as far as Copiapò it is not uncommon. — In its habits, in almost every respect, it resembles the Tapacolo, whose place, in these more arid parts, it may be supposed to supply. — When hopping its tail is not carried in quite so erect a position, as in that bird. —

With respect to the geographical distribution of this genus; in the damp & gloomy forests to the Southward, we have three species (2127 : 2531 : 3436). — in the intermediate country the Tapacolo & Turco, and a little more to the Northward, where the land is nearly a desert this sixth species. — It is a singular circumstance, that Molina, when describing the remarkable birds of Chile, says not a word about this genus. — Was he at a loss to classify it ?. —[1]

2175 2176 female Finch : male : called by Molina " Phytotoma rara ". Although to this day called " rara ", — or rare ; the farmers complain that, such is far from the case. — It is a very destructive bird to the buds of fruit trees ; is quiet & solitary, haunts hedge rows & thick bushes, in the manner of our bullfinch. — iris bright scarlet. — Specimen in Spirits (1043). —

2177 : 2178. Fringilla V. 2132

2179 : 2180. Trochilus (latter male) V. Page 60

2181 cop 2182 cop Larks. both males

2183 cop Water Hen : male :

2184 Bittern : female

2185 Woodpecker : female : called by Molina " Carpintero "

2186 *Valparaiso* Aug : Sept: [*1834*] MS. 66 Icterus ; frequents marshy grounds. builds in reeds | is found [abundantly *added*] all over Chili, as far as the valley of Copiapò. — Is common also in la Plata. Molina says it is called Thili or Chili, & from this derives the name of the country. —

2187. do. female.

2188 cop. Arenaria : male :

2189 Fringilla — male. —

2190 cop Red throated creeper : male.

2191 cop creeper female

2192 cop do male

2193 cop Long-tailed tit : V. 1469

2194 cop Wren : female : Builds in holes in walls ; in October

2195 Fringilla : male : " Siu " of Molina, often kept in cages.

2196 Emberiza. Male.

2197. cop Muscicapa : female : in small flocks amongst the hills. In the valleys of the Cordillera, at a height of between 8 & 10,000 ft, where the last remains of vegetation are found, this bird exists, where no other can. —

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[1] The discussion of this genus shows how Darwin was using his critical discernment of specific differences in the different geographical regions; the species were sharply defined in the changing habitats of the vast continent. Darwin expands his criticism of Molina in both *Beagle* '39 and '45 in almost the same words in a footnote which ends : " Was he at a loss how to classify them ? and did he think that silence was the more prudent course ? It is one more instance of the frequency of omission by authors, on those very subjects where it would be least expected."

It will be noted that Darwin alludes to the genus as *Myothera* in the O.N.s, but in both *Beagle* '39 and '45 the genus has become *Pteroptochus*, Rittlitz. He had therefore written the O.N.s before he had this new ruling.

Even in the Cordillera of Copiapò it was present! Hops & flies about (like a Stonechat) the streams & marshy spots; expands tail, especially *on alighting on stone or ground, like a fan. — Is this the same species as* (2128), which was always seen on the beach of Chiloe: if so an open place must be its attraction. —

2198 cop Muscicapa: female: V. 1819

2199 cop Muscicapa: female

2200 cop Swallow. male

2201 cop do. — do — other species

2208 Muscicapa. (same as 903). Has a large geographical range, being found
cop from la Plata, round by Tierra del Fuego to Northern Chili at Copiapò.
Valparaiso It is everywhere common, — is a most quiet, | tame inoffensive little
Aug: Sept: [*1834*] bird. Feeds on the ground; frequents sand dunes, sandy beaches &
MS. 67 rocky coasts. — May be said never willingly to leave the close neighbourhead
of the sea; but, as happens with Furnarius (1823) the broad stony beds of the torrents in Chile, have tempted it inland. Is said to build in low bushes.

2220 cop Dove. female

2296 cop Myothera. V. 2172

2297 cop Furnarius. V. 1222

2298 cop Tufted tit; is tolerably common: is found also in Patagonia & T. del Fuego: Habits like a Parus, hopping about bushes. I found in August its nest, which was placed in a bush, was small soft & simple. —

2299 Fringilla V. 1615

2300 Fringilla: female. —

2319 Nest of *large* Humming bird (2179)

2320 Nest of (2132). Fringilla dinca

2321 Penguin. coast near Valparaiso. —

N B Besides the Birds enumerated, I saw the following. Icterus 1784 very common: Sturnus ruber. do: Turdus 2125. common: Vanellus 1602: Furnarius 1823: Furnarius 1467. rare: Scolopax-Perdrix: Certhia 2084: Certhia 2129: Vultur aura: Condor: Caracara. 2 species: Lanius 2124 common: Alcedo 2122: Fringilla 2016. rare: Fringilla 2017 not uncommon. — These birds were all shot within a few miles of Valparaiso. —

I may here also add a list of the few birds I saw in crossing the Andes to Mendoza, at a height which could not have been less than 8000 ft: at the upper limit of vegetation: Condor: Fringilla 1615: Fringilla 2015: Furnarius 1823: Muscicapa 2197: and at about 10,000 ft. a Trochilus, species unknown. |

MS. 68

2375 Egg of Lanius (2124)

2425 Nest & eggs of *Trochilus (2134)*

2426 Egg of Furnarius (1823)

2427 Egg of Partridge (2159) Valparaiso

2434 cop Godwit in large flocks. East coast of Chiloe

2435 cop Grebe do — do —

2436 Myothera. — not common. — called by the Chilotans Cheuqui ; — there is a very close resemblance in habits, & even in plumage, to the Cheucau (2127). A resemblance — which the nearly similar name would appear to indicate. Forest. East coast of Chiloe

2479 } 2480 } Woodpecker. Male & female, shot up on a mountain, in the Peninsular of Tres Montes.

2481 Dove Hab : — do — do

2501 Curlew : male : this bird is very abundant on all the mud-banks, which surround parts of Chiloe : as the flock rises, a shrill note is uttered by each bird — interesting species allied to N. Hudsonius [*Note added in margin.*] N. = Numenius

2502 cop Wren : male : Inhabits the impervious mass of decaying vegetable matter in the interior parts of the forest amongst the Islands of the Chonos Archipelago. It hops about in a skulking manner, & every now & then utters its strange & loud notes. — This bird frequents the same kind of places with the Myothera. Does not the size of its coarse legs & beak point out some distant alliance ? This wren is (if I remember) the same as that of Port Famine ; I am told also it has been, but most rarely seen in central Chili

2503 Trochilus : male ? V 2134. —

2531 cop MS. 69 Myothera : male : commonly called by the English the Barking bird, & by the Chilotan Indians " Guid-guid " — It is abundant in the forests of the West coast, from Concepcion, to | some way South of the Peninsular of Tres Montes. In Chiloe, where this specimen was shot, they are very common ; at intervals in almost every part, a noise *precisely* like the whelping bark of a puppy may be heard. From this resemblance arises its English name. — When walking in a pathway or along the beach, suddenly the barking will be heard close by ; in vain may a person intently watch the thicket, whence, every now & then the noise proceeds ; in vain may he try, by beating the bushes, to see its author ; at other times by standing still, especially within the forest, the bird will hop close by. It is rather shyer than the Cheucau, but in its manners & general appearance very closely resembles that Bird. Like the Turco of Chili it is with difficulty made to take flight. — Is said to build its nest amongst sticks close to the ground ; — The nature of the country offers good reason, why this bird & the Cheucau, build in such a different manner from the Tapacolo & Turco ; in these forest[s], it would be impossible to make a deep hole, in other than extremely humid soil. [*Note B added, between the two (a)s on verso* Specimen of Barking bird in Spirits (1157)] In my rough notes on the Chonos Islds, I describe the strange noises, which may commonly be heard within, yet without destroying the silence of those gloomy forests. The whelping of the Barking bird, & the sudden whew-whew of the Cheucau, sometimes

come from afar & sometimes from close by; the little black wren adds its cry. The Certhia follows the intruder, screaming & twittering. The
MS. 69 *verso* Humming bird, darts from side to side emitting like | an insect its shrill chirp. And lastly from the top of some high tree, the indistinct, but plaintive note of the white-tufted Muscicapa. (1819) may perhaps be noticed.[1]

MS. 69(a) *verso* [*added later*] These forms appear to our eyes singular to be the common birds. throughout an extensive country. In T. del Fuego the Certhia & Troglodytes were the two most abundant kinds. — In central Chile both are found, but extremely in few numbers. — In that country (& in a like manner in a like case in other countries) one is apt to feel surprise that a species should have been created, which appears doomed to play so very insignificant a part in the great scheme of nature. One forgets, that these same beings may be the most common in some other region, or might have been so in some anterior period, when circumstances were different. — Remove the Southern extremity of America, & who would have supposed, that Certhia, Troglodytes, Myothera, Furnarius had been the common birds over a great country. —[2] |

MS. 70

2555 : cop 2556 : cop. Myothera; latter number is a male: stomach almost full of large seeds & remnants of a few insects. — Valdivia; thick forests; January.

2821 cop Coot. Concepcion.

2822 cop Hawk: male: Hab. do

2823 Partridge; *shot in the lofty Cordillera of Coquimbo, only a little below* the line of perpetual snow. — At a similar height, in the nearly *absolutely desert* mountains of Copiapò, I saw a covey of five rise together. On the wing the[y] [made *del.*] uttered much noise & flew like grouse: were wild : are said never to descent to the lower Cordillera — Coquimbo

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[1] With the help of Dr. Robert Stauffer and Dr. Sydney Smith, these "rough notes" have been identified with the contents of Vols. 30 i and ii, and Vols. 31 i and ii, *C.U.L. Handlist*. (See p. 204 above, draft II of Darwin's ornithological writing.) Much work remains to be done on these volumes, which contain the consecutive accounts of all Darwin's specimens in every realm, written on board *H.M.S. Beagle* shortly after the time of their collection. Here we can see the gaps in the numerical record in the O.N.s filled by other types of specimens. The ornithological portions are what Darwin had in front of him when compiling the O.N.s, and indeed he often copied passages almost verbatim. If it is now agreed that the O.N.s were written during the last months of the voyage, apart from the additions clearly made when within reach of expert opinion in England, then changes of Darwin's point of view or traces of early pointers towards evolution, may still be found in these volumes 30 and 31, which ante-date the O.N.s.

[2] This passage on species range and note on reverse of MS. 70, p. 260, show how much and for how long a time this question of distribution was exercising Darwin's mind. He noticed both how common species continued over extensive areas, and how widely divergent genera were sparcely represented far from those regions where they are or were common. (*Synallaxis* and *Scytalopus*.) In *B*. '39, p. 353, this discussion is somewhat enlarged, and he still remarks "One wonders why a distinct species should have been created." We can see this in the light of later knowledge as a very transparent curtain to evolutionary views far advanced. But I believe that already by 1834–35 there were questions being asked in the O.N.s that could only have been based on a groping belief in some form of descent with modification. I have looked up the equivalent passage in the early draft in Vol. 31 i, *C.U.L. Handlist* p. 277, reverse, Wilmot paper, 1828. Darwin writes from Valparaiso, dated Aug.–Sep. 1834: "It appears to me surprising how many of the birds of T. del Fuego & Patagonia are common in Chili" On p. 278 he writes: "The ornithology of the valleys on the Eastern slopes differ to a certain extent from the Pacifick sides." Here is a dated expression of surprise, and a dated search for species ranges and differentiation which should dispel for ever talk of random observations; Darwin was already seeking for an explanation of the origin of species.

2824 cop Myothera. Turco. V. 2172 Hab. do
2825 cop do. (diff. species) V. P.64 or No.2174. — do
2826 cop Furnarius. V. 1823 do
2827 cop do V. 1467 do
2828 cop Grey bird : male : very common in the worst Traversias, or deserts : do
2829 Fringilla Coquimbo

N.B. Before leaving the coast of Chili, I will give a list of all the birds I saw in the neighbourhead of the valley of Copiapò, in Lat. 27°. 20 S. As, a short way to the Northward of this, the desert of Atacama commences, where nothing can exist, this valley makes an important boundary in the country & no doubt limits the distribution of many birds. — Fringilla : 1615 : 2177 : Thenca 2169 : & white tailed bird closely allied to do : 2193 : Wren 2194 : 2197 : Dove : 2163 : Lanius 2124 : Icterus 2186 : Scolopax-Perdrix : Fringilla 2017 : 2825 : 2172 : 2125 : 2297 : 1823 : Swallow. 2200 : Hawk. 2014 : Caracara 2029 : & vulgaris : Condor : Partridge 2823 : the common kind, although so abundant in the next valley to the S. of Guasco is never seen here. |

[*These two lines deleted with two oblique lines.*]

MS. 70(a) *verso* It appears to me, that when the lists & collections of birds made in the different parts of S. Southern America, are compared, a large number will be found to have surprisingly large geographical ranges. No doubt the similarity in physical constitution of the country ; over T. del Fuego & the whole west coast as far north as Concepcion ; & again, between Patagonia, the lofty valleys of the Cordillera, & northern Chili ; & lastly but in a much lesser degree ; between la Plata & central Chili, is the chief cause of this fact. — I should observe, that in the few cases, where I have spoken of Lima, (Lat 12°) as the Northern Habitat of any species ; it is probable, that the real boundary lies ten degrees further north, (near C. Blanco) where the arid open country of Peru is converted into the magnificent forest land of Guyaquil.[1] — |

MS. 71
3189 cop Petrel. Callao Bay, — Lima
3190 cop Petrel. Iquiqui. Peru
3191 cop Plover. near sea beach. do.
3204 cop Tyrannus. — Lima. —

[*The writing of the five Galapagos pages is almost uncorrected and well written, suggesting a new pen and time for reflection.*]

The Archipel : of *the Galapagos* : *end of Sept* & part of Oct : 1835

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[1] This note added on reverse of MS. 70, is clearly written *before* Darwin had had time for a full comparison of his lists and collections of birds. In Vol. 29 i, *C.U.L. Handlist*, p. 41 (Fincher 1836 Watermark) occur Tables of ranges of birds crossing or not crossing the Andes, showing the direction of his thought soon after his return home.

1835 These islands are scattered over a space of ocean, included between 125 miles of Latitude & 140 of Longitude. They are situated directly beneath the Equator and about 500 miles from the coast of S. America. The constitution of the land is entirely Volcanic; and the climate being extremely arid, the islands are but thinly clothed with nearly leafless, stunted brushwood or trees. On the windward side however, & at an elevation between one & two thousand feet, the clouds fertilize the soil; & it then produces a green & tolerably luxuriant vegetation. In such favourable spots, & under so genial a climate, I expected to have found swarms of various insects; to my surprise, these were scarce to a degree which I never remember to have observed in any other such country. Probably these green Oases, bordered by arid land, & placed in the midst of the sea, are effectually excluded from receiving any migratory colonists. However this may arise, the scarcity of prey causes a like scarcity of insectivorous birds & the green woods are scarcely tenanted by a single animal. The greater number of birds haunt, and are adapted for, the dry & wretched looking thickets of the coast land: here however a store of food is laid up. Annually, heavy torrents of rain at one *Galapagos* MS. 72 particular season fall; grasses and other plants | rapidly shoot up, — flower, & as rapidly disappear. The seeds however lie dormant, till the next year, buried in the cindery soil. Hence these Finches are in number of species & individuals far preponderant over any other family of birds.[1] Amongst the species of this family there reigns (to me) an inexplicable confusion. Of each kind, some are jet black, & from this, by intermediate shades, to brown; the proportional number, in all the black kinds is *exceedingly* small; yet my series of specimens would go to show, that, that color is proper to the old cock birds alone. — On the other hand — Mr. Bynoe & Fuller assert, they have each a small jet black bird of the female sex. —[2] Moreover a gradation in form of the bill, appears to me to exist. — There is no possibility of distinguishing the species by their habits, as they are all similar, & they feed together (also with doves) in large irregular flocks. — I should observe, that with respect to the probable age of the smaller birds, that in no case were any of the feathers imperfect, or bill soft, so as [to] indicate immaturity, & on the other hand — in no case — were the eggs in the ovarium of the hen birds much developed. — I should suppose the season of incubation would be two or *three months* later. —

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[1] The interest in the capture of the specimens during the voyage was evidently shared by other members of the expedition. Discussions must have taken place—or perhaps Darwin sometimes maintained silence to preserve the peace. Captain FitzRoy's account of the birds of the Galapagos is worth quoting in this respect.

" All the birds that live on these lava-covered islands have short beaks, very thick at the base, like that of a bullfinch. This appears to be one of those admirable provisions of Infinite Wisdom by which each created thing is adapted to the place for which it is intended. In picking up insects, or seeds which lie on hard iron-like lava, the superiority of such beaks over delicate ones, cannot, I think, be doubted . . . " *Voyage of the Beagle*, Vol. II : 503, 1839.

[2] Opposite this passage in margin is written " analogous [or analogues] to Mr. Blyth's case."

3296 Heron : female. — sea coast & salt lagoons. —
3297 cop 3298 [*Encircled in MS*] Caracara. (former male, latter young female) V. P. 42
3299 cop Duck : male : salt water lagoons : bill lead coloured. base of upper mandible purple with black marks above.
3300 Bittern. Female
3301 do — do
3302 cop Tern. — F
3303 cop Owl. — Male. Fuller has another species |
Galapagos MS 73
3304 cop Gull : male
3305 cop Dove : do : One of the most numerous birds in the Islands.
3306 cop Thenca : male : Charles Isd —
3307 cop do : do : Chatham Isd. —

These birds are closely allied in appearance to the Thenca of Chile (2169) or Callandra of la Plata (1216). In their habits I cannot point out a single difference ; — They are lively inquisitive, active *run fast*, frequent houses to pick the meat of the Tortoise, which is hung up, — sing tolerably well ; are said to build a simple open nest. — are *very* tame, a character in common with the other birds : I *imagined* however its note or cry was rather different from the Thenca of Chile ? — Are very abundant, over the whole Island ; are chiefly tempted up into the high & damp parts, by the houses & cleared ground.

I have specimens from four of the larger Islands ; the two above enumerated, and (3349 : female. Albermarle Isd.) & (3350 : male : James Isd). — The specimens from Chatham & Albermarle Isd appear to be the same ; but the other two are different. In each Isld. each kind is *exclusively* found : habits of all are indistinguishable. When I recollect, the fact that the form of the body, shape of scales & general size, the Spaniards can at once pronounce, from which Island any Tortoise may have been brought. When I see these Islands in sight of each other, & [but *del.*] possessed of but a scanty stock of animals, tenanted by these birds, but slightly differing in structure & filling the same place in Nature, I must suspect they are only varieties. The only
Galapagos fact of a similar kind of which I am aware, is the constant | asserted
MS. 74 difference — between the wolf-like Fox of East & West Falkland Islds.
[**1835** Sep–Oct] — If there is the slightest foundation for these remarks the zoology of Archipelagoes — will be well worth examining ; for such facts [would *inserted*] undermine the stability of Species.[1]

3308 cop Yellow breasted Tyrannus : Female : Chatham Isld :
3309 cop Scarlet do. Male
3310 Wren Male

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[1] Sir Gavin de Beer has pointed out to me that in Evolutionary Notebook I, begun in July, 1837, there is a further clue which helps to date the Galapagos passage. Page 7

3312	Fringilla		Male	
3313	do.		(Sex unknown)	
3314	do.		Female	V. suprà
3315	do.	—	do	
3316	do.	—	Male	
3317	do.		Male	
3318	do.	—	Male	
3319		—	Male	

3320 3321[2] 3322 3323 (Icterus 3320: Male. jet black).(3321 : 3322 Males) (3323 Female). This is the only bird, out of the number which compose the large irregular flocks, which can be distinguished from its habits. — Its most frequent resort is hopping & *climbing* about the great Cacti, to feed with its sharp beak, on the fruit & flowers. — Commonly however it alights on the ground & with the Fringilla in the same manner, seeks for seeds. The rarity of the jet black specimens is well exemplified in this case; out of the many brown ones which I daily saw, I never could observe a single black one, besides the one preserved. Mr. Bynoe however has another Specimen; Fuller in vain tried to procure one. — I should add that Specimen (3320) was shot when picking together with a brown one, the fruit of a Cactus.

3324 Fringilla. Male. (Young?)

3325 do — Female. — |

Galapagos—
MS. 75

3326 Fringilla: Female: there were very many individuals of exactly the same plumage. —

3327 Fringilla — Male

3328 do — Female

3329 do — do

3330 . . . Male :) (3331 Female) (3332 Male). — This species is well charac-

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of Note-book I, (*Bulletin of the B.M. Historical Series*, **2** : No. 2, 1960), consists of the following remarks:

"Let a pair be introduced and increase slowly, from many enemies, so as often to intermarry, who will dare say what the result.

"According to this view, animals on separate islands, ought to become different if kept long enough apart, with slightly differ[ent] circumstances. — Now Galapagos tortoises, mocking birds, Falkland fox, Chiloe fox. — English and Irish Hare. — "

The Galapagos passage in the O.N.s must have been written before Darwin knew of the Irish and English Hare, for the "only facts of a similar kind" of which he was aware when he wrote this much quoted passage, were the differences between the East and West Falkland Foxes.

There is also a passage in the last of the small pocketbooks Darwin carried with him for immediate notes on the voyage, in which at any rate some of the entries date from the last lap home, though others may be of later date. There are notes on the islands of Ascension and St. Helena, and quotations from conversations with Sir A. Smith and Sir J. Herschel, both of whom he met at the Cape of Good Hope. In this pocket-book he writes :—" Ascension, vegetation ? Rats and Mice : at St. Helena there is a native Mouse."

Here the idea originating in the Galapagos is being applied to islands visited later in the homeward journey.

[2] Encircled number; unexplained.

3331 terized by its curious beak. — Is a true Fringilla in its habits. — I only
3332 saw this bird in one Island. — James Isld — & in one part alone of it. —
Was feeding in considerable numbers with the other species. Mr. Bynoe
has a much blacker variety. — [Capt. FitzRoy's specimen comes from
same isld — *written in margin*.]

3333 Fringilla. — Male
3334 do — do
3335 do — do
3336 do — do
N B. The Gross-beaks are very injurious to the cultivated land; they stock up seeds & plants, buried six inches beneath the surface. —

3337 do — Female. — Upper Mandible is in Pill Box. (3361)
3338 do — do
3339 do — do
3340 Male
3341. Fringilla. Male. — I saw specimens with *precisely* similar plumage, which were females
3342 cop Tyrannus. Male. (Young of 3309 ?)
3343 cop — do —
3344 cop — Female
N.B. This genus Tyrannus frequents the upper damp woods as well as arid country.

3345 cop Tyrannus: Male: I believe this species is certainly distinct from the scarlet breasted one; (& its yellow breasted female ?) (3309)
3346 cop Sylvia. Male. Frequently near the coast. —
3347 cop do. — do.
3348 cop do Female
3349 cop Thenca. Female. Albermarle Isd
3350 cop do — Male — James Isd
V. 3306. —

3351. Water Hen: Female
3352 cop do. Female
3353 do. Male
This is I believe, the only bird which is exclusively found in the high & damp |
Galapagos parts of Charles & Jame's Isld. — It frequents *in numbers* the damp beds of Carex & other plants; uttering loud & peculiar crys. — There is no water in these parts, but the soil is humid. — Is said to lay from 8 to 12 eggs. — iris bright scarlet: is called Gallinita del monte. —

3354 cop Charadrius. Female (rather less British specimen Gould. but accords in all its markings)
3355 cop Tringa — Male
3356 cop Swallow: Male: This bird was seen in small numbers near some bold rocky precipices on the coast, in one part of James Isd. & no where else. —
3357 cop Charadrius. Female. — AEgialitis semipalmata
3358 : cop 3359 [*Inserted* Pelidna minutilla] Fringa. both Females. — Same as N. American Species.
3362 Contents of the stomach of a Flamingo: these sphaerico-concretionary globules appeared to me to be worth examining; they were involved in mucous matter, besides which the Stomach contained nothing. — The Bird was shot in a shallow, saltwater Lagoon. — Throughout this archipelago there is very little Calcareous matter. —

3374 cop Anthus. was shot by Fuller on James Isd : it was the only one specimen seen during our whole residence. It is described as rising from the ground suddenly & again settling on the ground. — Showed in its flight long wings, like a Lark ; uttered a peculiar cry. — Its structure appear[s] very interesting.

V. Infra Specimen for dissection (1309) in Spirits. —

3375 cop (a) Sterna shot in the ocean at night, some hundred miles from land in the Pacifick. (a) [MS. 76 *verso* :] Terns have been supposed not to go far to sea : Seventy miles off the R. Negro coast of Patagonia I saw some : and 120 miles from the nearest land off Bahia Brazil, there was a flock of the snow white kind fishing, late in the evening.

3413 Bird, common. New Zealand

3591 cop Land Rail ; very *common* on dry low coral small Islands of Cocos ; excepting Snipe, only bird without web-feet. —

Galapagos MS. 77 To conclude with the Ornithology of the Galapagos, I have reason to believe, the joint collection of Mr | B[y]noe Fuller & myself include all the land birds. There are no Hawks besides the Caracara : there are no Humming birds. — On the coast only one species of Gull, Tern, Duck : Heron, and two Bitterns all of which I have. — The Flamingo : Mother Cary's chicken : Procellaria 3190, & other species : [Frigate Bird *in margin*] Common Pelican & Gannet of coast of Peru, & other Gannet, black & white found in the Pacifick : Amongst the small Waders Mr Bynoe & Fuller possess species which I have not. I believe this the only imperfect (by 3 or 4 species) part of our Catalogue. —

Whether the Flora of these Islands is S. American ; or differs from it, in a like manner as Juan Fernandez does, which is much less further removed, I do not know : but the Ornithology to my eyes resembles that of the temperate parts of that Continent. —

Tameness of Birds There is one fact which is extremely singular in the Natural History of these Islds ; it is the tameness of all the land birds. It is common to the Thenca, to all the Finches, to the Sylvia, the Tyranni, the Doves & the Caracaras.[1] In Charles Isd., which had been inhabited some 6 years [*Altered from* has now been inhabited 6 years] a boy with a long stick, sits down by a well & kills as many doves & Finches as he wishes. — There is not a bird which cannot be killed by a switch & sometimes by a Hat or Cap. — I have pushed, with the muzzle of my gun, a Caracara off the branch, on which it [*corrected from* he] was sitting. The Thenca has drank water, out of the back or shell of a Tortoise, held in my hand, & has so been lifted from the ground ; I have even tried to catch them by the legs, but failed. In attempting to explain this, we must remark |

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[1] Obliquely in margin is written : " Will the Furnarius ever learn not to bore the walls." Also : " Rooks with guns ". An early indication of thought on the problem of the inheritance of instincts.

MS. 78 that no rapacious hawks or quadrupeds are found here; the only large animal is the harmless Tortoise. Do the birds mistake Man, for this huge Reptile ?[1] It must however be remembered[2] that these Islds for the last hundred years, have been frequently visited by Whaling & other vessels; & the Sailors wandering through the woods in search of Tortoises, always take delight in knocking down the small birds.[3] Excepting the often described stupidity of some pelagic birds; in only one other place, have we seen, during our voyage, an exemplification of a similar fact & that was in E. Falkland Isd. — The extraordinary tameness of the black Furnarius, has been remarked on since the time of Pernetty to the present day.[4] M. Lesson [likewise *added*] mentions it. But it is not peculiar to that bird. It is seen in the Caracara, Snipe & Goose. When lying down, on the rocky hills the Thrush & [Emberiza *del, possibly* ' birds ' *added*] hop all around & close to you. Even the true Hawks are not very wild.[5] It is the more remarkable in this Isd. as it is tenanted by true Hawks & Foxes, & has long been visited by Man.[6] This tameness & especially amongst the Water-fowl is strongly contrasted with the habits of the same birds in T. del Fuego. In that country, for ages past, they have been disturbed by the savage inhabitants.[7] Does the disposition or instinct of a bird gradually alter from any cause acting on *successive* generations ? I must confess, that on the desert banks of the S. Cruz (which probably had never been ascended [before us *del.*] by other Europaean before us) the Goose & Duck which at the Falklands are so tame, there were as wild as similar
MS. 79(a) birds in England. They might however | have been migratory from
verso T. del. Fuego. — The subject does not seem to me of very easy
MS. 79 explanation. — |

Frigate Bird. [*The Frigate bird passages have been much corrected and two sections deleted. Two additions were made on separate page, one*

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[1] " Like sparrow does cow " very faintly in margin.

[2] Faint suggested alterations are written over these words: " This is perhaps " and " This is more surprising ". In *Beagle* '39, p. 476 the sentence runs: " It is surprising that the change has not been greater." In *B.* '45, p. 399, " It is surprising that they have not become wilder."

[3] Faint marginal addition: " Formerly birds tamer ".

[4] Note (B) on p. 78a: " ς Was not the Furnarius tamer at the time of Pernetty, than at present ? V. Account. — See A. J. Pernety, *Journal historique d'un voyage fait aux Iles Malouines*, 1763–4. Berlin, 1769.

[5] A further faint insertion in margin occurs at this point a probable reminder for the final writing of the script for the printer. " In time of Pernety Malouines like Galapagos." Malouines was the old name for the Falkland Islands until ceded to Britain in 1771.

[6] Between the lines in this sentence are two almost illegible fragments: " turtles in land " and " increase probably owing to settlers ".

[7] Obliquely in margin is added: " Black necked Swan ". In *Beagle* '39, p. 477, Pernety's *Voyage aux Iles Malouines*, Vol. 11, p. 20 is referred to in a footnote, and quoted in the text. Pernety relates that it was impossible to kill the black-necked swan; Darwin comments: " It is rather an interesting fact, that this is a bird of passage, and therefore brings with it the wisdom learnt in foreign countries." In *Beagle* '45 the wording is slightly different, no footnote is given to Pernety, whilst further facts are recorded bearing on the tameness of birds and the wildness as regards man.

afterwards deleted. I give below firstly the original draft, including all deletions but indicating where the larger ones occur, and without corrections. Secondly I give the final form, with corrections and additions, and without the deleted sections.]

[*Original draft.*] Amongst the Galapagos Island[s], during several occassions, I was interested by watching, the habits of this bird, which partly explained to me, the cause of its peculiar figure. [del.] The Frigate bird, when it sees any object floating on the surface of the water, descends, with depending head, from a great height, like an arrow; and at the instant of seizing with its long beak the prey, it turns upwards, by the aid of its tail & long wings, with the most extraordinary dexterity. The bird never touches the water with its wings, or even with its feet; indeed I have not seen one, ever swimming on the water. [*Point of insertion of note* (3) *on separate page, and beginning of second deletion.*]

It is a noble bird seen on the wing, either when soaring in flocks at a stupendous height, or as showing their most perfect skill in evolutions, when many are darting at the same floating morcel. If the piece of meat sink above six inches beneath the surface, it is lost to the Frigate Bird [*Point of insertion of deleted addition* (*b*) *on separate page, and end of second deletion.*] (b) at Ascension this bird is said to destroy great numbers of the young [tortoise *del.*] turtle, as they come out of the eggs & run down to the sea. They take them off the sand in the same manner, as I have described from the surface of the water. One bird will swallow a considerable [number] one after another without waiting.

[*Final form of Frigate Bird passages, with corrections and additions, omitting three deleted sections. There is a large encircled A in the margin opposite the beginning, and a large square bracket.*]

The Frigate bird when it sees any object on the surface of the water, descends in an inclined plane from a great height head foremost with the swiftness of an arrow; and at the instant of seizing with its long beak & outstretched neck the floating morcel, it turns upwards, by the aid of its forked tail & long powerful wings, with extraordinary dexterity. The bird never touches the water with its wings, or even with its feet; indeed, I have never seen one swimming on the sea; one is led to believe that the deeply indented web between its toes is of no more use to it than are mammae [or the marsupial bones *inserted*] in the male sex of certain animals; or the shrivelled wings beneath the wing-cases firmly soldered together of some coleopterous beetles. — The Frigate is a noble bird, when seen, either soaring in a flock at a stupendous height (at which times it merits the name of the Condor of the ocean)[1].

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[1] There is no discussion of the Frigate Bird in either *Beagle* '39 or '45, though it is figured and discussed in *Zool. of Beagle* '41, where the analogies of the vestigial mammae and the marsupial bones with the partial webbing of feet are omitted. I can find no reason why the Frigate bird, over which Darwin had thought so much, should be left out of the *Journal of Researches*. He uses the argument in an evolutionary passage in *The Origin*, 1st edition, p. 185, 1872 edition, pp. 142–143, where he writes: "What can be

Pintado. Petrel. Is excessively abundant over whole Southern ocean : Do not generally extend further Northward than two or three degrees North cop of the Tropic : but on the coast of Peru saw them between 16°–17° S. [*Obliquely added in margin* : — Cook New Zealand.] These bird[s] differ rather in their habits from the greater number of their Congeners : agree most with Petrel (1335). Are Social, constantly following a Ship in numbers. — are very tame, — pass a good deal of their time swimming, seem thus to take their food. Often dive to the depth of a foot or two ; When quarrelling over any offal — utter a variety of harsh crys, not loud. — Flight rather slower, & more soaring than in many of the MS. 79(a) *verso* tribe, very elegant ; (a) as it alights on surface of water, expands tail like a fan. Although flying all day on a moonlight night they may be still seen on the wing. — I was told by a Sealer that they, together with (1335) & Mother Cary's Chicken, all build in the cliffs of South Georgia ; And that no other breeding place is known of. — They all arrive very regularly in September & leave again in the Autumn. — That the Albatross alone stay the Winter. —

The *small Blue Petrel* is found from Lat. 33° to 35° (agrees with Capt Cook's statements) cop over whole Southern Ocean. — Is wild, flight very rapid, solitary, or not many together. [See Lesson, *written in margin*.] Mr. Stokes informs me that, these birds build in holes on the Landfall Isd. in T. del Fuego. — These burrows are about a yard deep ; they occur over half a mile inland. On stamping on the ground, many will fly out of one hole —. Eggs white elongated, size of a Pidgeon. — |

MS. 80

Struthio Rhea. [*The name is lightly erased, and the paragraph is preceded by an unclosed square bracket, possibly connected with end of paragraph mark, MS.* 83(*b*). Beagle, '39 *closely follows the Ostrich passages, pp.* 105–110. Beagle, '45 *is considerably condensed and altered, pp.* 89–94.]

This bird is well known to abound over the plains of Northern Patagonia & the united Provinces of la Plata. It has not crossed the Cordillera to the Westward ; but I have seen it within the first range of mountains on the Uspallata plains [elevated *added*] between 6 & 7000 ft. — The ordinary habits of the Ostrich are familiar to everyone. They feed on vegetable matter ; such as roots & grass. [*Altered from* : ' & in their stomachs I have frequently seen roots '.] At low water at Bahia Blanca, I have repeatedly [frequently *del.*] seen three or four

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plainer than that the webbed feet of ducks and geese are formed for swimming ? Yet there are upland geese with webbed feet which rarely go near the water ; and no one except Audubon has seen the frigate-bird, which has all its four toes webbed, alight on the surface of the ocean. . . . The webbed feet of the upland goose may be said to have become almost rudimentary in function, though not in structure. In the frigate-bird, the deeply scooped membrane between the toes shows that structure has begun to change."

" Mammae in man & wings under united elytra " are mentioned together in Darwin's Notebooks on Transmutation of Species, Pt. IV, *Bull. B.M.* **2** : No. 5, Ed. by Sir Gavin de Beer, p. 148 MS, p. 177 print. As this Notebook was written after 3rd October, 1838, the above passage in the O.N.s must have preceded the Notebook by more than two years.

come down to the extensive Mud banks which are dry at low water. The Gauchos say it is for the sake of catching small fish. —

Although the Ostrich in its habits is so shy, wary & solitary, & although so fleet in its paces, it falls a prey, without much difficulty to the Indian or Gaucho, armed with the Bolas. When several horsemen appear in a semicircle it becomes confounded & does not know, which way to escape. — [is its best line to take *del.*] They generally prefer running against the wind; yet at the first start they expand their wings & like a vessel, make all sail. — On a fine hot day, I have seen Ostriches enter a bed of tall rushes & there squat concealed, till quite *closely* approached on horseback. It is not generally known that ostriches readily take to the water. — Mr. King informs me that at the Bay of San Blas & at Port Valdes in Patagonia he saw these birds swimming several times from island to island. — They ran into the water both when driven down to a point, & likewise of their own accord, when not frightened. — The distance crossed was about 200 yards, when swimming, very little of
MS. 81 their bodies appears | above water, & their necks are extended a little forwards, Their progress is slow. — On two occassions, I saw some Ostriches — swimming across the S. Cruz river, where its course was
MS. 81 *verso* about 400 yards wide & its stream rapid. Capt Sturt also in Australia, when descending the Murrumbidgee, saw two Emus in the act of swimming. [*Inserted later.*]

The inhabitants who live in the country, readily distinguish, even at a distance, the Cock bird from the Hen. The former is said to be larger & darker coloured, & its head bigger. The ostrich, I believe the Cock, emits a singular deep-toned hissing note; which cannot be described. When I first heard it, standing in the midst of some sand hillocks, I thought it came from some wild beast; It is a sound, which, it is not easy to tell whence it comes or from how far distant. — A Gaucho assured me, that he had once seen a snow white or Albino variety & that it was a most beautiful bird. — At Bahia Blanca, in the months of September & October an extraordinary number of eggs, were found all over the country. — The egg varies in colour from a pale straw yellow to white. — The eggs either lie scattered about, which are called by the Spaniards Huachos, & are never hatched, or are collected together into a shallow excavation or nest. — Out of the four nests, which I happened to see, three contained twentytwo eggs each, & the fourth twenty-seven. — In one day's hunting on horseback sixty-four [74 *del.*] were found; fortyfour [44 *del.*] of these were in two nests, & the remaining twenty scattered Hauchos. The Gauchos unanimously affirm, that the male bird alone hatches the eggs & for some time afterwards accompanies the young. — I conceive there is not the |
MS. 82 slightest doubt on the subject. The cock when on the nest lies very close, I have myself almost ridden over one. It is asserted that occassionally at such times, they are fierce & even dangerous, that they have been

known to attack a man on horseback, trying to kick & leap on him. — My informer pointed out to me an old man, whom he had seen much terrified by one chasing him. — [Chacing *corrected to* chasing.] I observe in Burchell's Travels in S. Africa, he remarks. " having killed a male Ostrich, & the feathers being dirty, it was said by the Hottentots to be a nest bird ". I understand in the Zoological Gardens, that the male Emu also, takes charge of the nest, & therefore this habit is common to the family. [1]

The Gauchos also unanimously affirm, that several females lay in one nest. I have been positively told, that four or five hen birds, have been seen to go, in the middle of the day, one after the other, to the same nest. I may add also that it is believed in Africa, that two females lay in one nest. (Burchell. Vol. I. P.280, —)
Although this habit at first appears very strange, I think the cause is sufficiently obvious. — The number of eggs in the nest varies from twenty to forty & even to fifty ; [*Beginning of amendment* (a) MS. 82(a) *verso*.][2] and according to Azara[3] to seventy or eighty. Now though it is probable from the number of eggs, found in one district being so extraordinarily large in proportion to that of the parent birds, and likewise from the state of the Ovarium of the hen, that she may, in the course of the season lay that number, yet the time required must be very long. — Azara states that a female in a state of domestication laid seventeen eggs, each at the interval of three days, one from another. — If the hen were obliged to hatch her own eggs, before the last was laid, the first probably would have been addled ; but if each laid a few eggs, at successive periods, in different nests, and several hens, as is stated to be the case, combined together, then the eggs in one collection, would be nearly of the same age. — [Under this view, each cock bird, or at least the greater number *del.*] If the number of eggs in one of these nests, is as I believe not greater [*altered from* the same] on an average than the numbers laid by one female in the season, then there must be as many nests as females, and each cock bird, will [in its turn *del.*] have its fair share in the labour of incubation ; and that during a period when the females could not sit, on account of not having finished laying. — [*End*
MS. 83 *of amendment* (a). *See Beagle* '39 *p.* 107, *Beagle* '45, *p.* 91–2] | I have before mentioned the great number of Huachos or scattered eggs ; so that in one day's hunting, the third part were found in this state. — It appears odd, that so many should be wasted. — Does it not arise from the difficulty of several females, associating together & persuading an old Cock to undertake the office of incubation ? It is evident, that there must at first be some degree of association between at least two females ;

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[1] The last sentence, referring to the Zoological Gardens, is added later, inserted between the lines.

[2] Originally stuck on with sealing wax. See Editor's Note, p. 208. |

[3] Voyage dans l'Amerique méridionale par don Félix de Azara, 1781–1803.

else all the eggs would remain scattered over the wide plain at distances far too great, to allow of the male collecting them into one nest. [*Addition* (*b*), *MS.* 83 (*a*) *&* (*b*).] Some have believed that the scattered eggs were deposited for the young birds to feed upon. This can hardly be the case in America, because the Huachos although often times found addled & putrid, are generally whole. — IP[1]

Avestruz Petise [*in margin, and deleted*] [*I give below the final corrected version of the story of Avestruz Petise.*]

MS. 83 When at the R. Negro in Northern Patagonia, I repeatedly heard the Gauchos talking of a very rare bird which they called the Avestruz Petise. They described it as being less than the common Ostrich (which is there abundant) but with a very close general resemblance; they said its colour was " overo " or mottled & dark; & that its legs were shorter, & feathered lower down. It is more easily caught by the bolas than the other species. The few inhabitants who have seen both kinds

MS. 85A [*intended for* 83A] affirm they can distinguish them apart from a long distance. — The eggs [of the small species *added*] appeared however more generally known, and it was remarked with surprise that they were very little less [than those of the Rhea *added*] but of a slightly different form & with a tinge of pale blue. — Some eggs picked up on the plains of Patagonia agree pretty well with this description, and I do not doubt are those of the Petise. — This species occurs [most *added*] rarely on the plains bordering the Rio Negro, but about a degree and a half further south.[2]

MS. 84 When at Port Desire in Patagonia (Lat 48°) [*Dec. 1833*] Mr. Martens shot an ostrich; I looked at it forgetting, at the moment, in the most unaccountable manner, the whole subject of the Petise, & thought it was a two-third grown one of the common sort. — The bird was cooked & eaten. — & my memory returned. Fortunately the Head neck legs,

MS. 84A XXX one wing & many of the larger feathers had been preserved. | From the fragments a surprisingly good specimen has been put together, and it is now exhibited in the Museum of the Zoological Society. Mr. Gould, who in describing this new species, has done me the honor of calling it after my name, states that besides the smaller size & different colour of the plumage the beak is of considerably less proportional dimension than in the common Rhea; that the tarsi are covered with differently shaped scales, and that they are feathered six inches beneath the knee.[1] In this latter respect, and in the broader feathers of the wing this bird perhaps shows more affinity to the gallinaceous family, than any other of the Struthioidae. — XXX | [End of later addition on p. 84a]

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[1] The continuity of the discussion on the Ostrich given in the above text, was only reached after one major deletion, and lesser corrections. I give here the text of the long deletion, to be replaced by (a), p. 82 (a). " now although it is probable from what I have seen & heard of the state of the Ovarium of the Hen, & from the number of eggs found in one district so [very *del.*] extraordinarily large in proportion to that of the parent birds [*query owing to blot*] that she may lay that number in the season, yet the time she must require is very long. — Before the last egg was laid the first would probably be addled [decayed *del.*] — If we believe that all the [each *del.*] females lay each a few eggs in several nests; the eggs in such nests, might be collected within a short period. — We shall thus explain the extraordinary number of eggs found in any district; and moreover | *each* cock bird some time during the whole season of laying [incubation *del.*] will be employed in incubation; and at a period, when the greater number of females could not sit, owing to not having finished laying. —"

[2] This passage stuck on with sealing-wax. See Editor's note, p. 208.

MS. 84 Amongst the Patagonian Indians in the St. of Magellan we found a half Indian who had lived some years with the tribe, but had been born in the Northern Provinces. I asked if he had ever heard of the Avestruz Petise? He answered by saying "why there are none others in the southern countries". — He affirmed that beyond doubt that the Avestruz & the Avestruz Petise were distinct birds (I may observe that Indians & such people are excellent practical naturalists). He informed me, that the number of eggs in the nest of the Petise, was considerably less than in the other, namely generally not more than fifteen, & he asserted that more than one female deposited these eggs. |

MS. 85 At S. Cruz we saw several of these birds they were excessively wary. I think they could see a person approaching, when he is so far off as not to distinguish the Ostrich. In ascending the river, few were seen but in our quiet & rapid descent, many in pairs & by four's & five's were observed. — It was remarked, & I think with truth, that this bird does not expand its wings, when first starting at full speed after the manner of the northern kind. The fact of these ostriches swimming across the river has been mentioned. —

In conclusion I may repeat that the Struthio rhea inhabits the country of La Plata as far as a little south of the R. Negro in Lat. 41°: & that the Petise takes its place in Southern Patagonia, the part about the R. Negro being neutral territory. Wallis saw Ostriches at Bachelors river (Lat 53°–54°) in the St. of Magellan, which must be the extreme Southern possible range of the Petise. —

[*Additional note* (*a*) 85 (*a*)i.] M. D'Orbigny when at the Rio Negro made great exertions to procure this bird, but never had the good fortune to succeed.[2] — The only notice I can find in any work of the existence of this species, is in Dobrizhoffer's account of the Abipones. (A.D. 1749) He says at Vol. I, p. 314. "You must know moreover that Emus differ in size & habits in different tracts of land: for those that inhabit the plains of Buenos Ayres and Tucuman are larger, and have black white and grey feathers, those near to the Straits of Magellan are smaller & more beautiful, for their white feathers are tipped with black at the extremity, and their black ones in a like manner terminate in white."

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[1] Darwin had recorded most of these differences himself nearly three years earlier. See below.

[2] M. Alcide D'Orbigny, traveller and author of *Voyage dans l'Amérique méridionale*, *7 Tom.* volumes, Paris 1835–47 seems to have made a prior claim to the discovery of *Rhea Darwinii*, so that Darwin's remark on his never procuring a specimen has an added interest. In the *Magazine of Natural History*, Vol. I, 1837, occurs the following note on p. 504.
"Notice respecting *Rhea Darwinii* Gould.
"We observe by a letter which lately appeared in one of the French Journals, that M. D'Orbigny claims the right of having first described the Rhea brought home by Mr. Darwin from S. America, and which Mr. Gould named, a few months since, R. Darwinii. It appears that M. D'Orbigny gave it the specific appellation of R. Pennata, but in his letter he does not refer either to his *published* characters, or to the specimen which he examined." M. D'Orbigny's claim seems to have been based on no serious foundation,

An account of the Abipones by Dobrizhoffer went out to America [between the year *del.*] 1749. Vol. I. p. 314. [*Last two lines lightly deleted.*[1] *This brings the Ornithological Notes to an end*]

APPENDIX: THE AVESTRUZ PETISE, *RHEA DARWINII*

The final version of the Petise story given above, was only achieved after considered changes had been made at different dates. J. Gould's authoritative description of the new species was the last entry to be added, after the remnants of the bird had been successfully assembled and shown at the meeting of the Zoological Society in London in March 1837, when it became officially *Rhea darwinii*.

I give below extracts of earlier drafts of the same story, for those who want to examine in detail Darwin's assessment of evidence. He firstly had to collect all the evidence available as to the existence of the second species of South American ostrich, with details of its reported range; secondly he had to reach certainty as to the identity of the bird so inadvertently cooked and eaten at Port Desire.

Firstly I quote from the *C.U.L. Handlist*, Vol. 31, i, pp. 212–3, in which all Darwin's specimens are listed chronologically, with entries recorded within a few months of the events described.

The first mention of the Petise follows after lists of seaweeds, dated Jan. and Feb. 1834, thus recording within six months his first knowledge of the bird from the frequent reports of the Gauchos in August, 1833 in Northern Patagonia. Darwin briefly describes the shooting of the Petise by Martens in December 1833 at Port Desire, adding:—" which I looking slightly at it pronounced to be a young one of the common sort,—that is it appeared to be 2/3 size of the common one. I also saw some live ones of same size, but entirely forgot the Petise. I have since reclaimed the Head, Legs & several feathers [*specimen numbers*] 1832 . . . 1836." He notes the differently shaped scales on the legs, the lower feathering, and describes the eggs of a bluish tint. He quotes the Gauchos description of " overo " or speckled for the plumage. He writes of their distribution :—" With the Patagonians at Gregory Bay Straits of Magellan, 1834, there was a semi-Indian who had lived with them four years. — He tells me there are no others, excepting the Petises in these Southern parts." In the margin is written :—" Agrees with Gauchos stating there to be many in S. José.

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[1] Martin Dobrizhoffer was for eighteen years a missionary in Paraguay, and as Darwin says in his deleted note, went out in 1749. His work, written in Latin, was first published in 1784, as well as a German translation from Vienna. The English translation was published by John Murray in 1822. Darwin's quotation from Dobrizhoffer ends after describing the black and white tipped feathers.

that like the other ostrich many females lay in one nest, but that mean number of eggs in one nest is considerably less, namely not more than 15. — (The Post Desire egg was a Walcho.)

Whatever Naturalists may say, I shall be convinced from such testimony. as Indians & Gauchos, that there are two species of Rhea in S. America. I bought from the Chinas some feathers & skin."

More than two years after the shooting of the Petise, Darwin added a note on the back of p. 212, *Handlist* 31, i, dated April, 1836. "The Beagle sailed from Keeling Island on April 12th, calling at Mauritius on the homeward journey." The note was marked for insertion opposite the shooting incident:

" In the plains of central Patagonia I had several opportunities of seeing this ostrich : it unquestionably is a smaller & darker coloured bird than the Rhea. It is *excessively* wary : I think they can see a person approaching, when he is so far off as not to distinguish the Ostrich ; in ascending the river tracks etc etc were very abundant yet we saw scarcely any : but when *rapidly* & quietly descending, we saw many, both pairs, & 4s & 5s together. It was observed, & justly, that this ostrich does not expand its wings, as the Northern one, always does, when first starting at full speed : takes to the water readily ; saw four crossing the river. where 400 yeards wide & very rapid ; & another day one. very little of the body appears above water."

By April, 1836, therefore Darwin was convinced that the two species were ' unquestionably ' different. The ethological characters evidently had helped Darwin in his diagnosis.

I will now turn to the early drafts of the *Ornithological Notes*, to compare them with this slowly-reached certainty :—it will be noted that they differ slightly, but significantly, from the final version given above.

First Draft of the Ornithological Notes.

" When at the R. Negro in Nothern Patagonia, Aug. 1833, I repeatedly heard the Gauchos talking of a very *rare* bird which they called Avestruz Petise. They described it as being less than the common Ostrich (which is there common) but with a very close general resemblance ; its colour was described as " overo " or mottled & darker ; that its legs were shorter & feathered lower down. Is more easily balled, than the other species, — Its egg however is more generally known, which is but very little smaller, than that of S. Rhea, but of a faint blueish-green color. — The Gauchos affirm they can distinguish the two kinds from a distance & that they are different birds. They occur very rarely on the Southern plains of the R. Negro, but that at about a degree & a half further South, they are tolerably abundant. One Gaucho said he distinctly recollected having seen one, many years before, near the mouth of the R. Colerado (to the N of R. Negro). They are said to prefer the plains near the sea."

Darwin then describes the shooting by Martens :—" I looked at it, forgetting at the moment, in the most unaccountable manner, the whole subject of the Petise, & thought it was a two-third grown one of the common sort. — The bird was cooked & eaten. — & my memory returned. Fortunately the Head & neck & legs had been preserved. The legs have different shaped scales & are feathered beneath the knees." He continues with an account of the other differences as before, and with the meeting the half-Indian in St. Gregory's Bay, Jan. 1834. " I asked if he had ever heard of the Avestruz Petise ? He answered by saying 'Why there are none others in these Southern countries.' He affirmed that beyond doubt that the Avestruz & the Avestruz Petise were distinct birds (I may observe that Indians & such people are excellent practical naturalists) . . . I procured a number of feathers & a piece of the skin from the Indians.[1] These are the only specimens which may be considered as *certainly* belonging to the Petise. Although from what I heard here, & from the rapidly increasing number of this species South of the R. Negro, it is far most probable, that the specimen at Port Desire was a Petise. From the same reasoning, I believe all the ostriches seen on the banks of the S. Cruz April–May 1834 (Lat : 50°) were Petises, & I accordingly collected some feathers. Specimen Number (2004)."

It is clear that in this early draft, Darwin had not yet reached a complete assurance as to the identity of the Port Desire ostrich with the Avestruz Petise ; he still writes that the only specimens which may be considered as certainly belonging to the Petise were those bought from the Indians.

A comparison of these notes of varied dates has convinced me that the order of writing them was as follows :—firstly, the first entries in *C.U.L. Handlist* of specimens, Jan.–Feb. 1834, whilst the events were still fresh in his mind. Secondly the first drafts of the *Ornithological Notes*, probably of several dates, but before April 2nd, 1836, when the Beagle arrived at Keeling Island. Thirdly the dated addition to the *C.U.L. Handlist* of April, 1836, when he was either at Keeling Island, or more likely, on the voyage to Mauritius, between April 12th and April 29th, 1836. (*See* Itinerary of Voyage, p. 210.)

The problem of the overlapping territories of the two Rheas remained lodged in Darwin's mind awaiting solution for the next years, as the references in the *Transmutation Notebooks* (B.M. Bull.) (1837–9) clearly show. There is one entry in one of the small pocketbooks of the voyage[2] that is so relevant to the Petise story that I give it here ; the evidence of the other entries suggests that they were written before reaching England. The passage occurs in one of the last small pocketbooks, in which Darwin also quotes remarks of Sir J. Herschel and Sir Andrew Smith at the Cape of Good Hope, May–June, 1836. This pocketbook is slightly larger than most, measuring 4 in. × 6½ in. On the cover is written in large ink letters by Darwin "Nothing for any Purpose". Front and back covers have square white labels with R.N., also in his writing, and "Range of Sharks" on the end one. Pencil and pen have been used; many pages have been cut out. On the inside of the front cover is written :—"The living atom having definite existence, those that have undergone the greatest number of changes towards perfection (namely Mammalia) must have a shorter duration, than the more constant. This view supposes the simplest infusoria same since commencement of world." The writing in ink of this passage is unusually neat, and the style suggests the possibility of a copied quotation; but there was no quotation marks. At anyrate, the thought conveyed was clearly one that deserved preserving for future pondering. Then follow rough geological notes on volcanic action, including the later islands visited in 1836. On p. 79, wedged in between passages on volcanic theory, comes the query :—"Ascencion vegetation? Rats & Mices. At St. Helena. There is a native Mouse."

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[1] In Beagle Diary, opposite the date Jan. 30th, 1834, p. 207, he wrote :—" The whole population of the Toldos were arranged on a bank, having brought with them Guanaco skins, Ostrich feathers etc."

[2] Not published, except for a few extracts in *V. of B.*, 1945.

That Darwin did use some of the small pocket books for stray jottings after his return is certain, but I think it can be proved that the following suggestions for pursuing lines of enquiry in which the Petise figures so large, were written during the voyage. For we know that he was rearranging and rewriting his geological material for publication before reaching Cape Town,[1]; these rough drafts must
[Pocket Book] therefore have preceded the writing of the letter dated April 29th, 1836.
p. 127 "Speculate on neutral ground for 2 Ostriches: bigger one encroaches
on smaller. — change not progressive: produced at one blow, if one
species altered: Mem: my idea of Volc. islands elevated. then peculiar
plants created, if for such mere points; then any mountain, one is
falsely less surprised at new creation for large — Australia. = if for volc.
isld then for any spot of land. = Yet new creation affected by Halo of
p. 128 neighbouring continent: as if any | creation taking place over certain
area must have peculiar character: . . . Great contrast of two sides of
Cordillera, where climate similar. — I do not know botanically = but
picturesquely = Both N & S great contrast from nature of climate . . .
Go steadily through all the limits of birds and animals in S. America.
p. 129 Zorilla: | wide limit of waders: Ascencion: Keeling: At sea so commonly seen at long distances: generally first arrives :—

"New Zealand rats offering in the history of rats, in the Antipodes a parallel case. Should urge that extinct Llama owed its death not to change of circumstances; reversed argument, knowing it to be a desert.

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[1] *V. of B.*, 1945, p. 138, letter to his sister from Mauritius, Ap. 29th, 1836. "Whilst we are at sea & the weather is fine, my time passes smoothly because I am very busy. My occupation consists in rearranging old geological notes: the rearranging generally consists in totally rewriting them."

Tempted to believe animals created for definite time: — not extin-
p. 130 guished by change of circumstances. The same kind of relation that common ostrich bears to (Petise — & diff kinds of Fournillia[?] extinct Guanaco to recent: in former case position, in latter time (or changes consequent on lapse) being the relation, as in first cases distinct cases inosculate so must we believe ancient ones: not *gradual* change or degeneration. from circumstances: if one species does change into another it must be per saltum — or species may perish. This representation [*altered from* inosculation] of species important, each its own limit, and represented. — Chiloe creeper; Furnarius, [Caracara *del*] Calandria. inosculation alone shows not gradation: . . . | [*See Addendum*[1] p. 278.]

[Pencil] 132 Propagation, whether ordinary, hermaphrodite, or by cutting an animal in two. (gemmiperous by nature or by accident) we see an individual divided either at one moment or through lapse of ages. — Therefore we are not so much surprised at seeing Zoophite producing distinct animals, still partly united, & egg which becomes quite separate. Considering all individuals of all species as each one individual divided by different methods, associated life only adds one other method where the division is not perfect. |

p. 133 "Dogs, Cats, Horses, Cattle, Goat, Asses, have all run wild & bred, no doubt with perfect success. Showing how creation does not bear upon solely adaptation of animals. — extinction in same manner may not depend. — There is no more wonder in extinction of species than of individual. | [2 pp. cut out.]

p. 138 " Investigate with greater care vegetation & climate of Tristan d.Acunha Kerguelen Land. Prince Edwards Isd., Marion & Crozet. L. Auckland. MacQuaries — Sandwich Isd.

p. 153 " When we see Avestruz two species. certainly different. not insensible change: — yet one is urged to look to common parent? Why should two of the most closely allied species occur in same country? In botany instances diametrically opposite have been instanced:"

More rough geological notes follow, which must have preceded the "rewriting" described in the letter of April, 1836, already quoted (footnote p. 276). So that the above notes on the Petise, interlarded with geological jottings, acquire a hall-mark and can be safely dated before April 1836.

Changes of species observed on the voyage up S. America's western coast, where the barriers were apparent, were, I believe, more closely noted and with increased interest and purpose, because of the experience of the two Rheas, where no dramatic barriers divided the two ranges. He already looked ahead into some of the difficulties to be faced. Then, in 1835, came the shock of seeing species differentiation through isolation actually in progress in the different islands of the Galapagos Archipelago, when I think it fair to say that the smouldering ideas broke into a small flame.

ADDENDA

1. On specimen no: 711, and the word "inosculate" (see above, p. 212 and p. 277). In a letter to John Stevens Henslow written from Monte Video on Nov. 24th, 1832, describing a consignment of specimens sent home to Henslow, Darwin wrote:—"There is a poor specimen of a bird, which to my unornithological eyes, appears to be a happy mixture of a lark pidgeon & snipe.—Mr. Mac Leay himself never imagined such an inosculating creature." Bracketed above the line after the word snipe, Darwin added "No: 711". The bird is described in *Z. of B.*, 1841, as *Tinochorus rumicivorus.* The letter to Henslow gives a dated proof that by November 1832, Darwin was familiar with Macleay's *Horæ Entomologicae*, published 1819–1821. The use of the word "inosculating" in conjunction with Macleay's name shows that Darwin had studied the diagrammatic, semi-mystical scheme of creation of *Horae Entomologicæ*, though a judgment of its usefulness to him may be suggested in the use of the subsequent word "imagined". In another context, however, this work may have served to stimulate Darwin to start his eight years' study of the Cirripedes, 1846–1854 (see Sydney Smith, Linn. Soc. Nov. 8th, 1962). Again, in the early note-book quoted above, p. 277, the word "inosculate", or "inosculating", occurs three times in the discussion on species' changes. Loren C. Eiseley has suggested that Darwin took the word from E. Blyth; probably Blyth also was well acquainted with Macleay's work, and he, like Darwin, drew on Macleay's terminology.

2. On specimen no: 1028 (see above, p. 213.) The capital P preceding Pezoporus refers to *Phalcobænus*, d'Orbigny's generic name; John Gould altered the name to *Milvago pezoporus*, see *Z. of B.*, p. 13, where the bird is discussed.

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